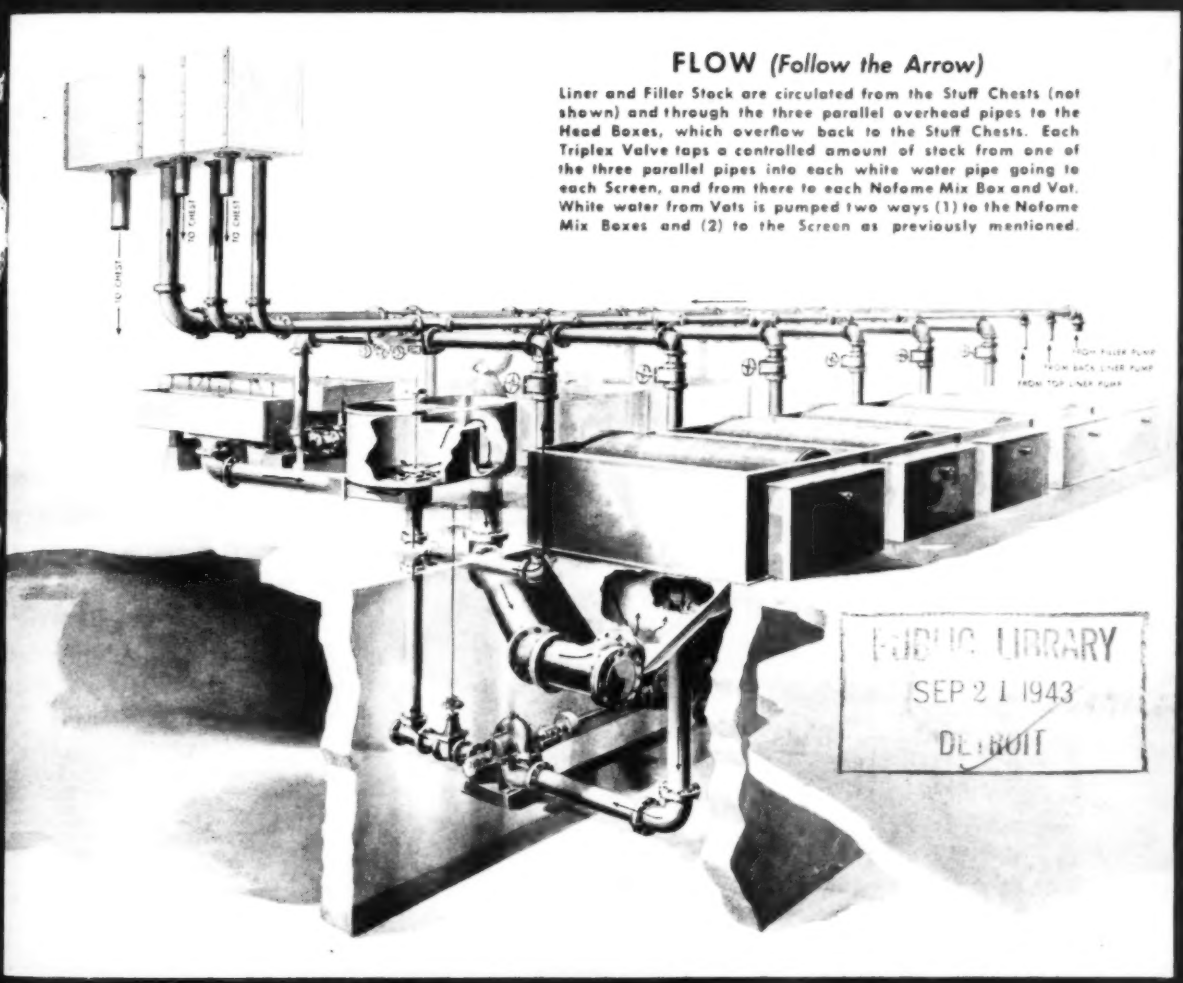
TECHNOLOGY DEPT.

THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—SEPTEMBER, 1943


FLOW (Follow the Arrow)
Liner and Filler Stock are circulated from the Stuff Chests (not shown) and through the three parallel overhead pipes to the Head Boxes, which overflow back to the Stuff Chests. Each Triplex Valve taps a controlled amount of stock from one of the three parallel pipes into each white water pipe going to each Screen, and from there to each Nofome Mix Box and Vat. White water from Vats is pumped two ways (1) to the Nofome Mix Boxes and (2) to the Screen as previously mentioned.
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TO CHEST
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FROM BACK LINER PUMP
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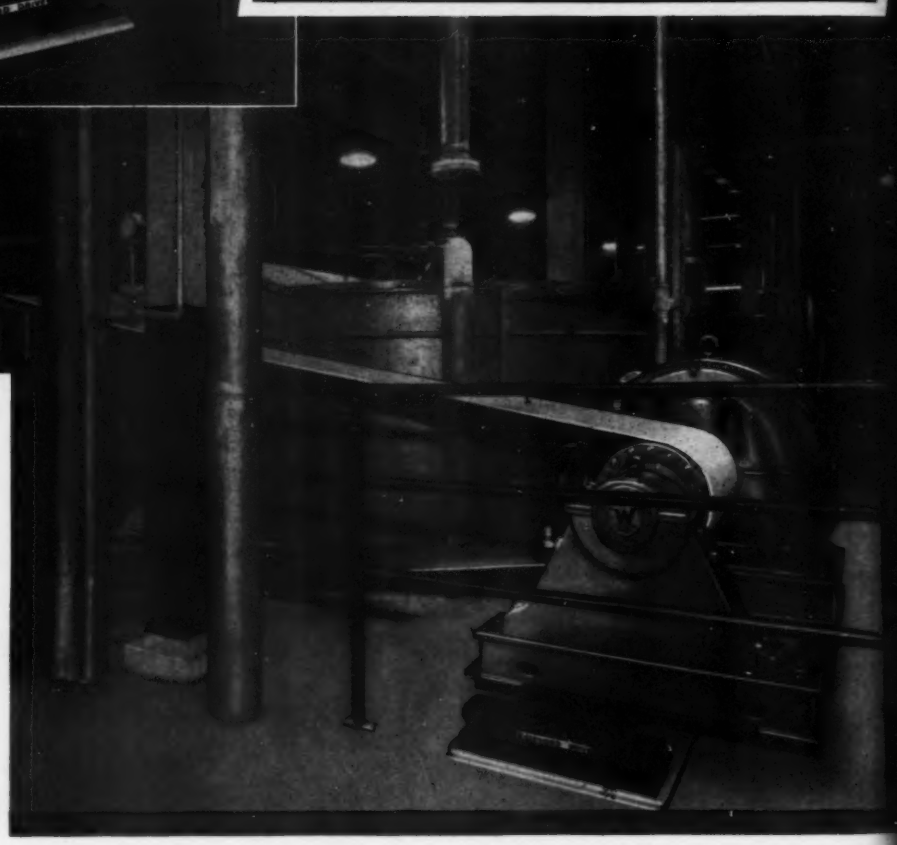
ROCKWOOD
automatic belt tightening MOTOR BASES



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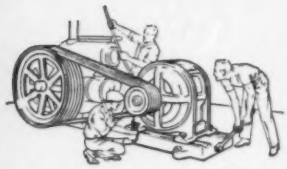

Costly shut downs for manual belt tightening are a thing of the past —too pasteful of time and labor. Thanks to the Rockwood pivoted motor base, belt tightening is now made automatic. Belts that stretch are automatically re-tightened— and made neither too tight nor too loose, but just right to suit varying loads. Rockwood bases are the biggest improvement ever developed for electric motor belt drives. Use with either V-belts or flat belts.

AUTOMATIC BELT TIGHTENING IMPROVES MOTOR BELT DRIVES

In almost every paper mill where one or more Rockwood Drives are first installed on trial and plant engineers then take time to carefully check results, the automatic belt tightening motor base soon becomes accepted mill practice. When mill engineers see how simply the Rockwood pivoted motor Drive takes up belt stretch, and how the belt tightness automatically matches each load change, it is obvious why the driven machine operates better and at mo dependable speeds.

Belt life—V-belt or flat—is increased, ordin ily doubled. Never before has a belt drive fro electric motor to driven machine been so sound engineered; that is the reason so many pap mill engineers are installing them. Write about your drives today for better mill ope ation tomorrow.

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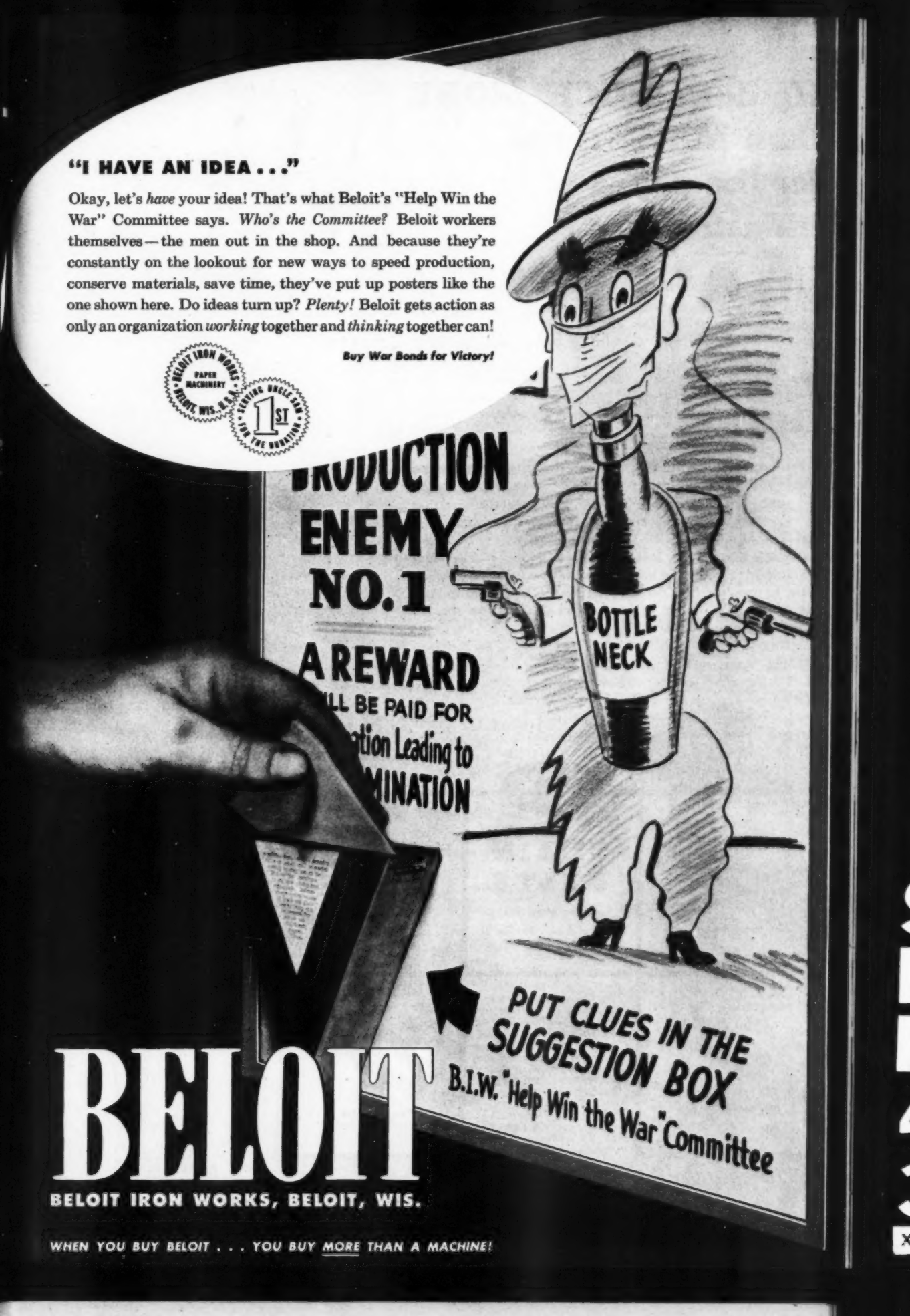
"I HAVE AN IDEA . . ."
Okay, let's *have* your idea! That's what Beloit's "Help Win the War" Committee says. *Who's the Committee?* Beloit workers themselves—the men out in the shop. And because they're constantly on the lookout for new ways to speed production, conserve materials, save time, they've put up posters like the one shown here. Do ideas turn up? *Plenty!* Beloit gets action as only an organization *working* together and *thinking* together can!
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WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE!

He does MUCH MORE than MAKE them for the paper industry

HE MANUFACTURES more than 2000 types and sizes of chain belts. That is, however, only a part of his business.

His business is mechanical engineering, the design . . . manufacture . . . application . . . selling and maintenance of special apparatus for transmitting power and handling materials.

In order to design and manufacture his chain belts, Rex Mechanical Engineering—Rex M. E.—must perform the functions of application and selling. These are in some ways his most important obligations.

Because of the complexity of modern industry, all engineers must seek and get from each other the extensive and intensive knowledge that only specialization can provide.

Application and selling are the technical information services provided by specialists to help analyze difficulties and find the best ways for surmounting them.

For this service Rex Mechanical Engineering—Rex M. E. —maintains a field organization, most of whom have served their apprenticeships in his drafting rooms and plants. For additional counsel, the territorial men call on specialized designing engineers in Milwaukee who have the advantages of national experience.

Through the work of all of these men in many fields, Rex M. E. is learning—and making available—much that is helpful to machine designers and maintenance engineers in the great work in which all engineers are engaged, namely, to achieve a maximal result at minimal cost and waste.

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★ *More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.*

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TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT — CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

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Not things of beauty, those huge ungainly barrage balloons that hover over our convoys at sea and over cities and bases overseas! But our boys know well how comforting it is to see in the sky these tough, durable synthetic rubber balloons, with their miles of steel cables, standing guard against attack by enemy bombers.

All over the world, wherever our fighting men go, Mathieson Chemicals in one form or another go with them —not only in barrage balloons, but in ships, planes, tanks, guns, gasoline and lubricants, clothing, food, medical and sanitation supplies. For Mathieson chemicals—chlorine, caustic soda, soda ash, ammonia and other Mathieson products—are vital raw materials in nearly every phase of American war production.

Today, while it goes without saying that "the needs of our Armed Forces come first," Mathieson is exerting every effort to supply materials for civilian needs as well. Tomorrow, when final victory has been won, Mathieson will again stand ready to render its normal peace-time service to American industry.

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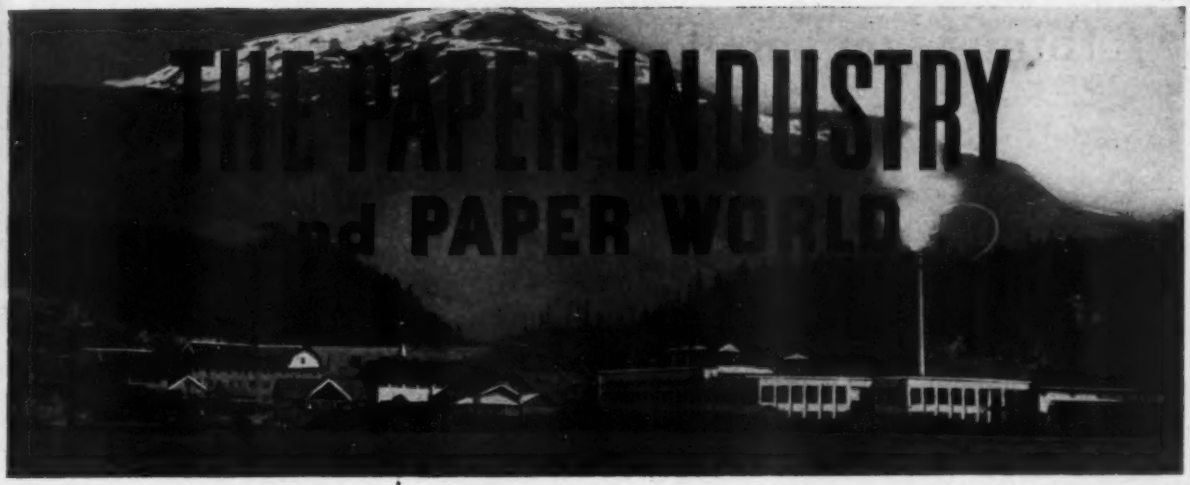

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7 things you should do to keep prices down!

If prices soar, this war will last longer, and we could all go broke when it's over. Uncle Sam is fighting hard to keep prices *down*. But he can't do it alone. It's up to *you* to battle against any and every rising price! To help win the war and keep it from being a hollow victory afterward—you must *keep prices down*. And here's how you can do it:

1. BUY ONLY WHAT YOU NEED

Don't buy a *thing* unless you *cannot* get along without it. Spending can't create more goods. It makes them scarce and prices go up. So make everything you own last longer. "Use it up, wear it out, make it do, or do without."

2. PAY NO MORE THAN CEILING PRICES

If you do pay more, you're party to a black market that boosts prices. And if prices go up through the ceiling, your money will be worth less. Buy rationed goods only with stamps.

3. SUPPORT HIGHER TAXES

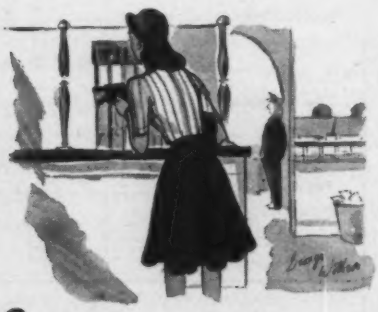
It's easier and cheaper to pay for the war as you go. And it's better to pay big taxes *now*—while you have the extra money to do it. Every dollar put into taxes means a dollar less to bid for scarce goods and boost prices.

4. PAY OFF OLD DEBTS

Paid-off debts make you independent now . . . and make your position a whale of a lot safer against the day you may be earning less. So pay off every cent you owe—and avoid making new debts as you'd avoid heiling Hitler!

5. DON'T ASK MORE MONEY

in wages, or in prices for goods you have to sell. That puts prices up for the things all of us buy. We're all in this war together—business men, farmers and workers. Increases come out of everybody's pocket—including *yours*.



6. SAVE FOR THE FUTURE

Money in the savings bank will come in handy for emergencies. And money in life insurance protects your family, protects you in old age. See that you're ready to meet any situation.

7. BUY WAR BONDS

and hold them. Buy as many as you can. Then cut corners to buy more. Bonds put money to work fighting the war instead of letting it shove up prices. They mean safety for you tomorrow. And they'll help keep prices down today.

KEEP PRICES DOWN . . .

Use it up . . . Wear it out . . .

Make it do . . . Or do without.

This advertisement, prepared by the War Advertising Council, is contributed by this magazine in cooperation with the Magazine Publishers of America.

How to connect

to your present equipment

It is easy to connect glass piping to any pipe line, valve, pump or tank in your plant. If you have hesitated about installing a trial piece of glass piping or a short line because of the possible difficulty of making a tight joint with your present equipment, here is the answer to your problem.

Use the proper adaptor flanges, drawings of which are shown herewith. You can now purchase these standard stock adaptor flanges to connect Pyrex piping directly to:

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With these adaptor fittings it is a simple matter to discover to your own satisfaction just where you can profitably use PYREX piping—places where you can take advantage of its remarkable resistance to all acids and alkalies (except HF), resistance to abrasive action of slurries and gritty particles, and its ability to withstand thermal shock. Its crystal-clear transparency and its long life and reasonable cost may mean that it is the best piping for that line which has been giving you trouble. Here at Corning our research facilities have helped to find the answers to many troublesome piping problems. Corning engineers offer you the benefits of this experience. Send in the coupon or write to the Industrial Division, Corning Glass Works, Corning, N. Y.

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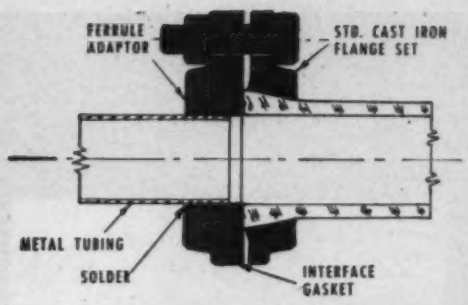
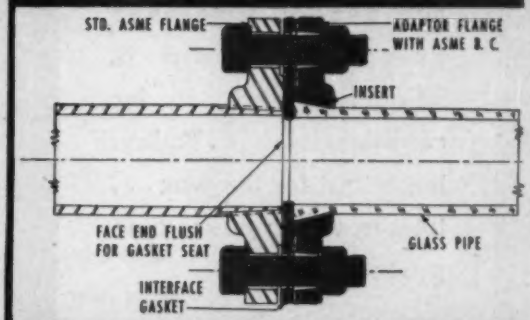
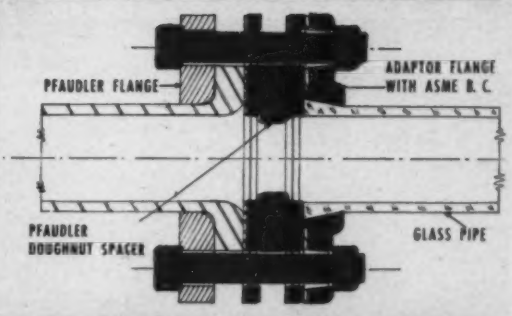
Pyrex Industrial Glass



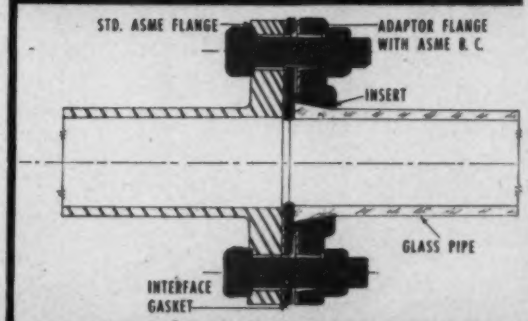
Connection to metal tubing



Connection to A.S.M.E. screwed flange



Connection to Pfaudler enamel-lined



Connection to A.S.M.E. flanged fitting

*Accessory parts in red furnished by Corning

Corning Glass Works, Industrial Division, Dept. PI
Corning, New York

Gentlemen: I would like glass piping information immediately on the subjects I have checked below. I understand there is no obligation.

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☐ PYREX Piping and Heat Exchangers ☐ Adaptors

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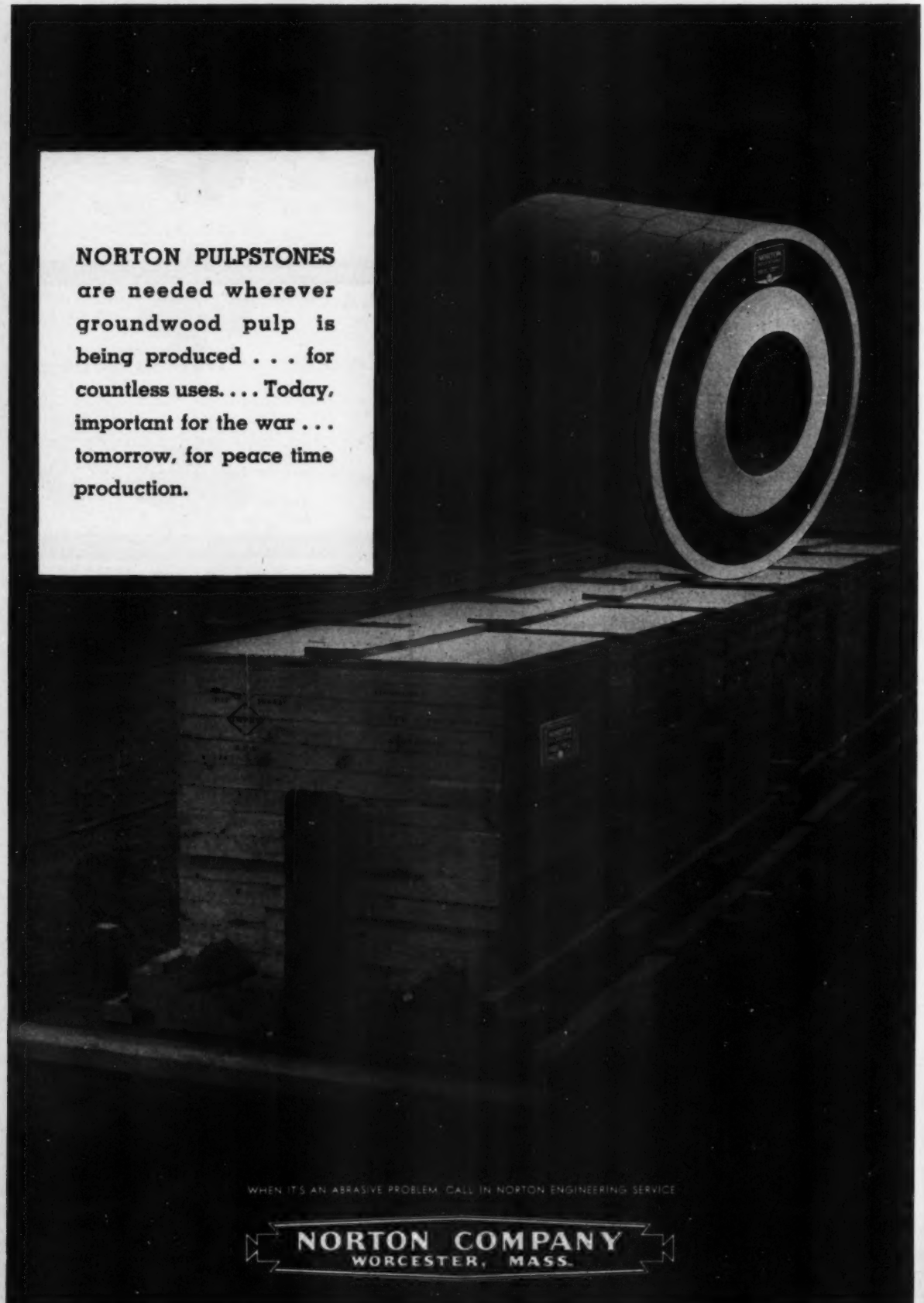
NORTON PULPSTONES
are needed wherever groundwood pulp is being produced . . . for countless uses. . . . Today, important for the war . . . tomorrow, for peace time production.
WHEN IT'S AN ABRASIVE PROBLEM CALL IN NORTON ENGINEERING SERVICE
NORTON COMPANY
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Em no mekim peper 'long Sawt Pacific!

Ask the Marines...they know what that Pidgin English means...

"They don't make paper in the South Pacific."

But a lot of paper is used on all of our war fronts, afield and at home. Paper products are doing their full share to win this war... tough, weatherproof corrugated shipping boxes, weatherproof solid fiber containers, paper boxes, and just paper in its many forms.

We are proud that the Stein-Hall Starch Combining Process and our line of materials for the paper industry are helping to make high quality paper products fit for serving our fighting men and women.

Due to war conditions limiting raw materials, not all of our standard products for paper processing are readily available.

But backed by our experience in serving the Paper Industry for 77 years, our Paper Laboratories have developed alternate materials to serve the same purposes and are ready to do their best to help you solve your wartime problems.

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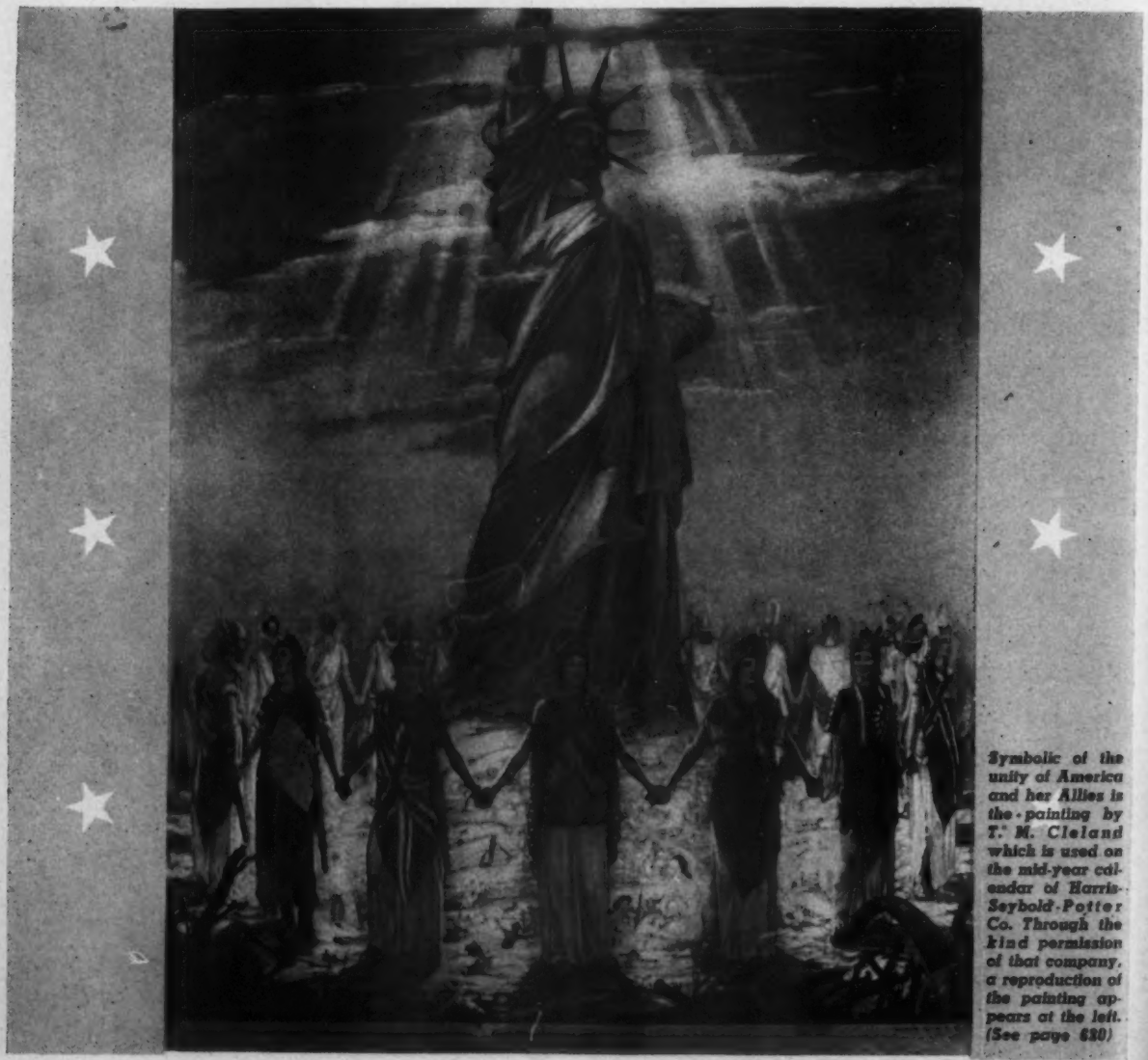
They Won't Be Home for Christmas

For our armies far away, there must be a Holiday,
That will cheer their souls, and tell them we remember.
'Tis so little we can do, for those soldiers staunch and true,
Who will not be coming home in December.

Santa pleads, "Oh, have a heart," and Uncle Sam will do his part,
To deliver Christmas gifts from folks at home.
Don't disappoint those Yanks—they deserve undying thanks
From a land where peace and good will still are known.

(Mail their gifts now! See instructions page 588.)



Symbolic of the unity of America and her Allies is the painting by T. M. Cleland which is used on the mid-year calendar of Harris-Seybold-Potter Co. Through the kind permission of that company, a reproduction of the painting appears at the left. *(See page 630)*

TRADE WINDS

An Action Program for the Paper and Pulp Industry

▶▶▶ UNLESS IMMEDIATE and effective steps are taken the economy of the United States will be gravely affected by a drastic shortage of paper. Paper production is dependent on wood pulp production and wood pulp production is dependent upon pulpwood production.

Receipts of pulpwood during the first six months of 1943 were 24 per cent (2,100,000 cords) or less, than for the same period in 1942. Mill inventories of wood declined by 32 per cent (1,100,000 cords) during this period. By the end of June unfilled orders for paper and paperboard had reached nearly 1,200,000 tons.

Wood pulp production during the first six months of 1943 amounted to 4,550,000 tons compared with 5,521,000 tons in the first six months of 1942. This represents a falling off in wood pulp production of almost 1,000,000 tons or a decrease of 17.5 per cent. Inventories of wood pulp now stand at the lowest point of record.

Basic to the drain on wood pulp inventories is the existing and potential shortage of pulpwood. With the exception of the South and to a degree the Pacific Northwest, pulp production, which means paper production, is dependent upon pulpwood cutting six months to one year in advance. If pulpwood cutting in the Northeast and Lake States is not initiated and fully manned and equipped within the next eight weeks pulp production from these areas will probably not exceed 60 per cent of normal in 1944.

In the Southern region wood production and use are possible and necessary on a current basis. Existing shortages are affecting the production of vitally needed strong fiber pulp to a point that war and other requirements are already being seriously affected.

In the Pacific Northwest the great market pulp mills are either idle or operating at low production rates that permit them to hold an operating crew only with difficulty. In the meantime, the mills dependent upon purchased pulp face economic annihilation and the Nation faces a paper shortage that will stagger the war and civilian economy.

EDITOR'S NOTE: The accompanying release was issued August 17 by E. W. Tinker, executive secretary of the American Paper and Pulp Association, New York City.

Only by the adoption and enactment of a specific plan of action, region by region, can the situation be saved. The following steps have already been taken:

1) Pulpwood cutting has been declared an essential activity by the War Manpower Commission. Employment offices and draft boards have been notified.

2) $1,000,000 has been appropriated by Congress to expedite the production of forest products.

3) A Deputy Administrator* in the Pulp and Paper Branch of the War Production Board, whose sole responsibility will be pulpwood production, has been appointed.

4) The industry has initiated, in co-operation with publishers, an extensive campaign to encourage pulpwood production.

The pulp and paper industry submits the following plan based upon facts and experience:

National Requirements

1) The situation with respect to pulpwood is so acute that the War Manpower Commission is fully justified in placing woods labor cutting pulpwood on the same basis as agricultural labor. This will require a uniform and co-ordinated program directed to all employment offices and draft boards.

2) Office of Price Administration action on price questions affecting pulpwood production should be immediate and with due consideration to the effect upon production. Action by the Office of Price Administration should be co-ordinated with objectives of the War Production Board. Field men of both agencies should consider conjunctively local price questions as they arise and prompt action on their recommendations must be had in Washington.

Co-ordination of policy and action between the lumber and the pulp and paper divisions of both OPA and WPB is essential. Conditions and requirements change and the public welfare and the prosecution of the war is not promoted by competition between and within public agencies. The necessities of the situation should control.

3) Industry recommendations looking to conservation of fiber should be approved at once. These recommendations were formulated after long and careful consideration. They cover the major tonnage items in the industry and have long awaited action.

4) Usable labor obtainable from new sources such as prisoners of war, imported labor and evacuees eligible for relocation should be made available where conditions permit their use, and forestry battalions of the U. S. Army should immediately be formed and established. The situation justifies the transfer of experienced wood cutters from other industries and, in addition, furloughs from the Army of this class of labor should be provided.

5) Action to encourage increased forest products production implemented by the appropriation of $1,000,000 for this purpose by the Congress should stress pulpwood production—a product particularly adapted to farm labor and equipment.

6) Every necessary step to facilitate the importation of pulpwood, particularly from Russia, should be taken.

(*) A. B. Hanson, Cf. P.I.&.P.W. August, 1943, page 470.

Northeastern Region

1) Northeastern pulpwood production has over a long period of years been predicated upon the availability of from seven to nine thousand seasonal woods laborers from Canada. With the growing shortage of labor in Canada, the number available has been progressively reduced. In addition, as the situation has become increasingly acute on the American side of the line, those available have been sought and granted to new industries not traditionally accustomed to their use. This situation, added to the acute local shortage, is without precedent and if not remedied will be ruinous. The cut in the number of Canadian laborers available for use in the United States should not exceed proportionate cuts required in the Canadian industry. Regional conditions in Canada and the United States may require special considerations.

2) Traditionally, northeastern mills, either through ownership of forest lands or through contractual arrangements, have been dependent on wood imported from Canada. A definite policy and plan should be developed with the Canadian Government which will assure the continuation of such imports to the maximum degree. The past practice of belated action followed by hurried consideration should be superseded by a fixed policy and plan.

3) The possibilities of securing Newfoundland labor should be explored.

4) Because of the combination of circumstances involving the curtailment of available Canadian labor and domestic shortages of labor, definite recruitment plans should be immediately developed and prosecuted by employment offices in co-operation with the companies concerned, and implemented by specific instructions from the War Manpower Commission.

Southern Region

1) Absenteeism on the part of woods workers is the largest factor in causing the existing acute shortage of wood supplies in the South. This condition in other industries has been to a considerable degree cured through effective action on the part of the War Manpower Commission. A definite plan of action should be developed and effectuated that will reach the southern woods worker in a way that he will understand.

2) Recruitment action similar to that suggested for employment offices in the Northeastern Region should be applied in the Southern Region.

Lake States Region

1) The woods labor force of the Northern Lake States has to a large extent disappeared because of repeated recruitment for projects in other regions or more lucrative local or regional employment. It is now necessary that this program be reversed. Otherwise pulpwood and consequently pulp production will continue to decline.

2) Large importations of Canadian wood have been customary in this region. The same action prescribed for New England is necessary.

Pacific Northwest

1) Increased log production must be obtained. This means that skilled woods workers must be returned to the woods where their skills can be applied to the maximum contribution in our national economy.

2) In the allocation of logs provision must be made for sufficient supplies to operate existing pulp mills. Species customarily used for pulp production are not normally in economic competition with other uses. These logs should be returned to their highest economic use.

3) There should be established a parity basis between British Columbia pulp mills and American mills. The log supply available to both should be considered a pool and allocated to maintain maximum pulp production.

WISCONSIN FOREST INDUSTRIES COMM. IS FUNCTIONING

The Wisconsin Forest Industries Information Committee, formed at Wausau, Wisconsin, on July 2, under the leadership of Folke Becker, president of the Rhinelander Paper Company, has been actively engaged in a timely public relations campaign primarily designed to acquaint legislators, officials and the public at large with the aims, needs, problems and accomplishments of the industry. The personnel of the Wisconsin Committee is built upon the close relationship which exists between the pulp and paper mills, the sawmills, veneer mills, chemical plants, mines and other owners. Constant intercourse between these industrial units is maintained by virtue of interlocking ownerships or through the exchange of timber products between these various types of interdependent manufacturers. As a result, the objectives are the same, or very similar, because each is anxious to extract a sufficient volume of raw material from this reservoir of timber supply to keep up war production quotas and maintain plant operation.

Just now the common problem relates to timber production deficiencies for which manpower shortages in the woods is chiefly responsible. There are certain other contributing factors such as relationships of ceiling prices to the cost of producing pulpwood and logs; details of food rationing for lumberjacks; available tire supplies; and procurement of truck and tractor parts for logging operations.

Acting on the theory that a chronicle of industrial accomplishments is a necessary attribute to attract the attention of the public, the Committee points with justifiable pride to the performance of the Wisconsin forest industries in war production. It is extremely doubtful if any region in the world is now contributing such a variety of essential products extracted from the forests including pulp and paper products, veneers, hardwood and softwood lumber, charcoal, chemicals, etc. As a long range demonstration, with direct appeal to the public, are the attainments in reforestation and the cultivation of renewed timber supplies. In this respect paper and pulp mills have set a high example for the entire group. Outstanding developments in this field are displayed by Consolidated Water Power & Paper Company, Nekoosa-Edwards Paper Company, and the Tomahawk Kraft Paper Company, all of whom have established large and thriving plantations of pine pulp timber.

All of these subjects are being explained and demonstrated to public officials and results to date are gratifying. Wisconsin Congressmen are returning to Washington after the Congressional recess with a new perspective of the importance of the pulp, paper, and other forest industries, both as to their essential character in the war and in the domestic economy.

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NEW RIVER TERMINAL AND WAREHOUSE AT CHATTANOOGA, TENN.

A river terminal and warehouse was dedicated at Chattanooga, Tennessee, August 27. This terminal cost $183,000 and it is the first of four such terminals financed by the TVA at a total cost of $600,000. The other three are at Guntersville, Decatur, and Knoxville, Tennessee.

This opens the Tenessee River for 652 miles for year-around navigation. Linked with the Mississippi system of inland waterways, the possibilities for commercial navigation on the Tennessee are enormous. ⟶

PAPER · · · America's 6th Industry

PAPER LEARNS TO SWIM . . .

(NEWS ITEM: *Weather-protected paperboard boxes of spare parts for tanks can be dropped overboard from freighters and picked up later by small boats at low tide.*)

When a tank is sent abroad, what amounts to about five more tanks in parts, must accompany it. Shipment of these spare parts are being made by our Ordnance Department everywhere on the face of the globe.

The paperboard containers that package these parts are being subjected to every weather condition. Routes are often through extreme heat and raw cold . . . goods are often lashed on deck . . . containers must often be dumped overboard to float until there is time to pick them up.

The Paperboard Industry has worked hard and long to perfect containers suitable for such purposes.

\ \ \

The experience of the Puseyjones Organization is freely offered to mills engaged in aiding the war effort. Any letdown in quality or quantity of production is a threat to our "all out for Victory."

The new Puseyjones Controlled Pneumatic Loading System consists of an air cylinder self-contained in the press housing and operated in connection with the bell cranked arm carrying the upper roll.

With Controlled Pneumatic Loading, the life of the felt is increased, broke reduced, more effective drainage obtained and the quality of the sheet improved.

Puseyjones men and production facilities are still on war work. However, since the War Production Board has declared the Paper Industry essential, we are in a better position to supply vital repair and replacement parts to keep present equipment operating efficiently.

PLANNING AHEAD? For paper and pulp mill executives looking forward to post war production problems, we will gladly furnish reprints of three informative articles prepared by Puseyjones engineers — "The Post-War Fourdrinier Machine," "Development of Stream-Flow Vat System," "The Flow Spreader." Ask for reprints by name.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington, Delaware, U. S. A.

THE SIGN OF TRADE MARK QUALITY

The present general cargo terminals are designed to facilitate the handling of assorted freight shipments. Predictions are that by 1960 barge shipments will reach more than 6,000,000 tons annually. The principal commodities in order of tonnage are: sand and gravel, coal, gasoline, wheat, piling and cross ties, corn, lumber, iron and steel products, clay, elemental phosphorus, soda ash, and automobiles. It is believed that after the War, when pulp is again shipped in from Sweden and South Europe to New Orleans and Mobile, that transshipment by barge up the Mississippi and Tennessee will become entirely practical.

◆

FINANCIAL

▶▶▶ PAPER MILL SECURITIES dropped off in values with the general drop in prices in the securities markets, but while prices were nominally lower, the volume of sales of such securities was reduced, indicating that holders were not alarmed by the market trend to a sufficient extent to sacrifice their holdings. A broad picture of the paper industry's situation is given by a National City Bank survey of statements by eighteen representative manufacturers of paper and paper products. The combined earnings of these companies decreased 21.4 per cent from their earnings in the first half of 1942, and the annual return on net worth decreased from 8.1 per cent to 6.2 per cent in 1943. These reductions were due almost entirely to the increased federal and other taxes.

American Box Board Company—Net profit for 24 weeks ending May 15 was $87,159 as compared with $158,933 for the same period a year ago.

American Writing Paper Corporation—Net profit for the first half year was $101,650 as compared with $203,304 for the same period in 1942.

Champion Paper and Fibre Company—Profit for the fiscal year ending April 25 was $2,532,212 as compared with $3,129,986 for the preceding fiscal year.

Consolidated Water Power and Paper Company—Net income for the first six months of the year was $658,402 as compared with $626,663 for the same period a year ago.

Continental Diamond Fibre Company—Net income for the first half of the year was $426,956 as against $295,388 for the same period in 1942.

Dixie Cup Company—Profit for the fiscal year ending June 30 was $899,564 as against $828,902 for the previous fiscal year.

Filer Fibre Company—Profit for the fiscal year ending May 31 was $54,541 as compared with $126,872 for the preceding fiscal year.

Robert Gair Company—Net income for three months ending June 30 was $260,211 and for the first half of the year $414,410 as compared with $513,891 for the first half of 1942.

Gaylord Container Corporation—Net profit for six months ending June 30 was $258,940 as against $497,524 for the same period in 1942.

Great Northern Paper Company—Net profit for the half year was $650,793 as against $848,214 for the first half of 1942.

Hinde & Dauch Paper Company—Profit for the six months ending June 30 was $510,693 as compared with $453,621 for the first half of 1942.

Hummel-Ross Fibre Corporation—Net earnings for seven 4-week periods ending July 10, after provision for state and federal income and excess profits taxes, was $187,983.

International Paper Company—Net profit for the quarter and for the six months ending June 30 was $2,320,082 and $4,343,201 respectively as against $2,170,087 and $4,639,982 for the comparable periods in 1942.

Keyes Fibre Company—Net income for the first half of 1943 was $150,909 as compared with $167,022 for the same period of 1942.

Kimberly-Clark Corporation—Net profit for the quarter ending June 30 was $559,118 as against $484,358 for the comparable quarter in 1942, and $485,572 for the first quarter. Net for the year ending June 30 was $2,190,277 as compared with $2,603,227 for the year ending June 30, 1942.

Mead Corporation—Net profit for the twelve weeks ending June 12 was $228,603 as against $381,115 for the similar period in 1942.

Minnesota & Ontario Paper Company—Net profit for the first half of the year was $722,026 as compared with $724,974 for the same period in 1942.

Nekoosa Edwards Paper Company—Net income for the first half year was $301,117.

Oxford Paper Company—Net profit for the six months ending June 30 was $470,333 as against $368,391 for the same period in 1942.

Scott Paper Company—Net profit for the first half of the year was $665,247 as against $766,467 for the same period a year ago.

Union Bag & Paper Company—Net income for six months ending June 30 was $264,289 as compared with $1,042,640 for the first half of 1942.

United Paperboard Company—Net profit for the fiscal year ending May 29 was $37,453 as compared with $371,375 for the preceding fiscal year.

New York Stock Exchange—Stocks

	Closing Prices August 25, 1943	July 24, 1943
A. P. W. Paper Co.	*17⅞–2½	2½
Celotex	12⅞	14¼
Same Preferred	19	20
Certain-teed	5⅞	6⅞
Same Preferred	52½	60⅝
Champion P. & F. Co.	20	23¼
Same Preferred	*107–107¼	107½
Container Corp.	19⅛	22⅞
Continental Diamond.	*12–12¾	14⅝
Crown Zellerbach	15⅛	15⅝
Same Preferred	98¼	95½
Dixie Vortex	*12¾–13⅜	15¾
Same "A"	44¼	43¾
Robert Gair	2½	3⅛
Same Preferred	*12–12¾	13⅛
Gaylord Container	*12⅞–13¼	13¾
Same Preferred	*51¼–52	51¼
International Paper	10⅜	12¾
Same Preferred	57⅜	62¼
Kimberly-Clark	32	34
MacAndrews & Forbes	*26–26¾	27¼
Masonite	37⅜	42
Mead Corp.	8	9½
Same Preferred	84	85
Paraffine Cos.	*41½–43	*43½–44
Same Preferred	101	*104–105
Rayonier	13¼	15¼
Same Preferred	*31–32	30
Scott Paper	*41½–43	42⅜
Same 4½% Pfd.	*111–113	113
Same 4% Pfd.	*111–112¼	111–112
Union Bag & Paper	9⅛	11¼
U. S. Gypsum	*68–68¼	72½
Same Preferred	177½	*184–184½

New York Stock Exchange—Bonds

Abitibi 5%	.....	.....
Celotex 4½%	.....	101
Certain-teed 5½%	101¾	100¼
Champion P. & F. Co. 4½%	.....	.....
International Paper 5%	104⅛	104½
Same 6%	106	107

New York Curb Exchange—Stocks

Am. Boxboard	.....	7¾
Great Northern	.....	34
Hummel-Ross	.....	4¾
St. Regis	3⅛	4
Taggart	3¾	4½
United Wall Paper	2½	2¾

*Closing Bid and Asked Prices.

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▶▶▶ TO RELIEVE THE LABOR SHORTAGE, Brown Company, Berlin, New Hampshire, has requested the War Manpower Commission to assign Italian prisoners of war to work in the lumber operations. The company's supply of raw material has been greatly curtailed due to shortage of manpower in the woods. One of its mills has been closed for this reason.

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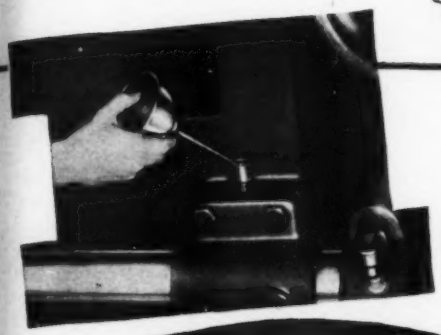
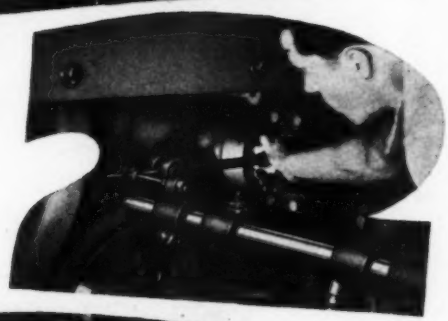
▶▶▶ DEDICATION OF the largest "tree farm" in America was held at Klamath Falls, Oregon, August 5, and Governor Earl Snell presented the Western Pine Association's first tree-farm certificate. The tract, 506,000 acres, is owned by the Weyerhaeuser Timber Company, Longview, Wash.

Easy as trimmers in to keep your Seybold tip-top condition



DO THIS ONCE A DAY

Lubricate the drive shaft, bearing, clutch and all other moving parts. Clean dust, lint and old grease from operating surfaces. Inspect the cutting knife.

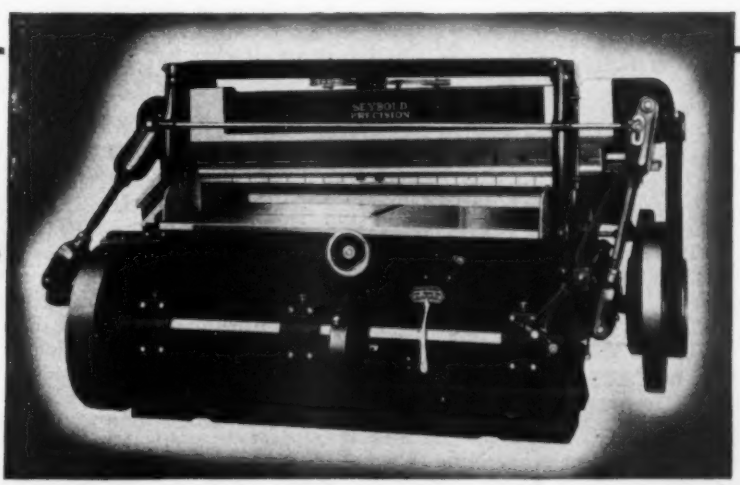


DO THIS ONCE A WEEK

Check the clutch and brake adjustment.

DO THIS ONCE A MONTH

Inspect the clamp pressure mechanism.



if you want this

to last for years and years

Should you require repair or maintenance service, call your SEYBOLD REPRESENTATIVE.

SEYBOLD

• DIVISION •

Washington News

NEWSPRINT INVENTORIES ORDERED CUT BY WPB

Newsprint inventories were cut by the War Production Board on September 6 from 50 to 40 days' supply in 26 northeastern and central states and from 75 to 65 days in 22 southern and western states. Publishers were instructed to reduce September delivery orders accordingly.

The committee recommended a net reduction of an additional 5 per cent in newsprint usage for the fourth quarter of 1943 at a meeting with War Production Board representatives in Washington on September 4. This is expected to bring about a total reduction of 15 per cent since the first of the year. The original Order L-240, effective January 1, 1943, reduced quotas by approximately 5 per cent, and a further 5 per cent cut was ordered on July 1.

◆

THE WPB ANNOUNCES CO-ORDINATION PLAN

The WPB has set up a program to increase the production of pulpwood and to distribute controls over all branches of the industry—from lumber down to finished paper products. This program has been put under the direction of Harold Boechenstein, director, Production Controls Bureau, of the WPB.

Mr. Boechenstein will act as pulp and paper co-ordinator with the primary purpose of determining policies to be followed. He will co-ordinate the functions of three WPB divisions: pulp and paper, containers, and printing and publishing.

◆

SUBCOMMITTEE ON BRAND NAMES AND NEWSPRINT CONDUCTS HEARINGS

World-wide attention was focused on the problem of the Nation's pulpwood supply by a series of hearings conducted in the United States and Canada by the House of Representatives Subcommittee on Brand Names and Newsprint, of which Congressman Lyle H. Boren, a Democrat of Oklahoma, is chairman. The Committee was originally named as a result of charges that Government officials were trying to regiment the nation's industrial production by restricting the use of brand names, thus destroying the goodwill established by years of industrial production. Such a policy, it was feared, would have an adverse effect on the newspapers, through eliminating a rich source of advertising. However, when the committee reached New York its attention was turned to the entire paper and pulp industry situation, rather than to the specific problem of its formation.

In broad terms, the view of the committee was stated by its chairman after hearings in New York, when he said that he believed the Government should devote its attention to the problem of producing more paper, and abandon its present program of dividing up a scarcity. By intensive efforts to secure adequate supplies of pulpwood, he believed, there could be provided sufficient wood to make the pulp needed to provide the nation with all the paper it requires, not only newsprint, but all grades. Other members of the committee took the same view, and that if there is any reduction, it should be on a horizontal percentage basis, rather than by any form of vertical allocations.

The committee sat for three days in New York, then went to Canada for further hearings, and impressed on Canadian authorities, as well as paper manufacturers, its belief that the solution of the whole problem is in getting a comparatively small number of men into the woods.

◆

JOINT 3-COUNTRY COMMITTEE NAMED

Donald M. Nelson, chairman of the War Production Board has named a joint United States-Canada-United Kingdom committee to report on the "requirements and supplies, uses, production and distribution" of the pulp and paper industries in the three countries. The committee is jointly sponsored by the Combined Production and Resources Board and the Combined Raw Materials Board.

Charles E. Adams, chairman of the board of the Air Reduction Company, and the U. S. Industrial Alcohol Company, is chairman, representing the United States, the Canadian member is Morris M. Wilson, president of the Royal Bank of Canada, and Sir Clive Baillieu of the Combined Raw Materials Board will represent the United Kingdom.

This committee will be able to make definite recommendations on such problems as the vital issue of how to get out pulpwood, how such wood will be allocated between the United States and Canada, and its decisions will have a direct effect on the problem of how United States consumers are to be provided with the required quantity of essential papers.

◆

WRITING PAPER IND. ADVISORY COMMITTEE

A Writing Paper Industry Advisory Committee has been appointed by the Office of Price Administration in an effort to establish a closer working relationship between that industry and the OPA. The committee, consisting of 21 men representing large and small companies and different geographical areas of the country, held its initial meeting in New York on September 9.

The papers manufactured by this industry have just been taken from under the General Maximum Price Regulation and put under a new regulation, Maximum Price Regulation No. 450 (Writing Paper and Certain Other Fine Papers).

◆

ADVISORY COMMITTEE FOR GROUNDWOOD SPECIALTY PAPERS

The OPA named nine representative members of the groundwood specialty papers industry to a Groundwood Specialty Papers Industry Advisory Committee on August 28. The first meeting of the group was held in New York City on September 10.

Groundwood specialty papers, which have just been taken from the General Maximum Price Regulation and put under a new regulation, Maximum Price Regulation No. 449 (Groundwood Specialty Papers) are types of papers, excluding newsprint and other specific exceptions, which contain 26 per cent or more of groundwood fiber and which are prepared for one or more of a large variety of end uses, the majority of which fall within the field of printing and publishing.

◆

QUEBEC PAPER MILLS VISITED BY MEMBERS OF U. S. COMMITTEE

Members of a sub-committee of the House of Representatives in Washington, D. C., headed by Lyle H. Boren, of Oklahoma, made a tour of inspection of the mills in the Quebec Province on August 14. The invitation to this committee to visit the Quebec mills was originally extended by the Canadian Department of External Affairs and the Wartime Information Board, and the tour was conducted under the auspices of the Newsprint

MORE AND MORE Escort Vessels to sink the SUBS

Sweeping the seas to sink the subs is the vital task of these sturdy, speedy ships. Down the ways come more and more of them . . . all to play an important part in destroying the enemy's wolf-packs. That is why speed in building Escort Vessels is the order of the day. But it is not enough to launch the hulls. They must be "fitted out" and put into service in the quickest time. And here, too, JONES has been called upon to extend our contribution in the building of war equipment . . . called upon to help complete component parts for these Escort Vessels. Machining the large frames to house the ships' motors . . . machining and assembling water-lubricated stern tube bearings and stuffing boxes . . . we are working at full speed ahead to help fit these vessels for sea duty so that our cargo ships can deliver the weapons of victory for our fighting men.

Jones

GEARED FOR WAR PRODUCTION

E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.

Builders of Quality Machinery for Paper Mills

Administration of the Wartime Prices and Trade Board and the Canadian newsprint industry.

Trips to Minnesota and Texas, originally planned to follow the tour in Quebec, were eliminated, it was announced, but the committee planned to investigate the Pacific northwest pulpwood and lumber regions in the United States and Canada.

◆

GOVT. AGENCIES HAVE PLAN TO INCREASE STRAWBOARD PROD'N

To increase strawboard production, the Pulp and Paper Division of the WPB is co-operating with the War Food Administration in a program designed to increase the collection of straw in various midwestern states. Due to the heavy rains and flood conditions this spring, a substantial portion of the available straw crop was destroyed, thereby adding to an already critical supply situation.

The proposed plan will result in State War Boards and County War Boards assisting strawboard manufacturers to locate available straw. Farmers in the areas will be urged to make this product available.

◆

WASTEPAPER DRIVE

A Wastepaper Conservation Drive headed by Norman F. Greenway, of Robert Gair Company, Inc., New York City, is now being sponsored by eastern paperboard mills in connection with the Salvage Division of the War Production Board, and twelve eastern cities have been designated thus far as wastepaper concentration areas. They are New York City, Philadelphia, Baltimore, Rochester, Albany, Providence, Boston, Richmond, Charlotte, Atlanta, Buffalo, and Hartford.

Newspaper and outdoor advertising will be used in these areas, featuring a campaign telephone number, which will be a clearing house for information and arranging pickups of the public's wastepaper accumulations. The campaign is being handled by the Olian Advertising Company, the agency that handled the first Wastepaper Conservation Campaign which ended in May, 1942.

◆

MUTILATED NEWSPRINT ADMITTED DUTY FREE

Customs officials have held that side runs of newsprint mutilated by the use of an axe or a roll breaker on the end of the roll are sufficiently mutilated to prevent their use for paper, and such shipments will be allowed to enter this country duty free as paper stock. According to Warren B. Bullock, manager of the Import Committee, the domestic industry has believed that mutilated newsprint should be permitted to enter this country duty free for use as a substitute for virgin fiber, but officials at some ports were in doubt whether a dozen or more indentations on the end of a roll should be considered mutilation, and sufficient to prevent the unwinding of the rolls and their use as paper. The Import Committee conducted a survey of domestic opinion, and as a result of the reports from the United States mills, the officials have decided to admit the paper duty free, as recommended by the Import Committee.

Whether 9-point Canadian corrugating material, consisting chiefly of straw, but in part of wastepaper and other fibers, is entitled to admission

HOW TO MAIL CHRISTMAS GIFTS TO MEN OVERSEAS

The task of handling an estimated 10,000,000 Christmas gift packages for soldiers overseas presents such a tremendous task that the Army Postal Service is asking the co-operation of all civilians.

Due to restrictions and time required for handling, the War Department has announced that overseas Christmas mail be posted between September 15 and October 15. Particular emphasis is placed on early mailing—rather than just before the deadline. Obviously, it will expedite handling if everyone makes a special effort to mail packages early. It is stated, however, that packages mailed before the deadline will reach the remotest outposts before the holidays.

The following regulations must be strictly observed:

Be positive the package contains the soldier's full and correct address.

Restrict packages to 5 pounds in weight, 15 inches in length, and 36 inches in length and girth combined.

Wrap the packages securely, but in such a manner that they may be opened easily for army inspection.

In advising that senders be positive they have put the soldier's full address on the package, the postal service reiterated that it should include: (1) The soldier's full name; (2) his rank; (3) his army serial number, (4) his service organization and unit, (5) his A.P.O. number and the respective port of embarkation postmaster.

After October 15 parcels may be mailed to overseas personnel *only* if each parcel is accompanied with a written request from the addressee.

Not a Baker's Dozen—They Only Got Eleven

Cold weather may be just around the corner, but these fishermen have something to prove their fish stories through the winter. No, it isn't quite fair for them to "point" with such pride to a string of speckled trout, with "points" so few, and fish having a "no point" value. The big one (the fish) at left, weighed 4¾ pounds—they didn't know the total weight of the catch. The fishermen are employed at the Bathhurst Pulp and Paper Company, Limited, Bathhurst, New Brunswick, and the fish were caught in a stream on the company's property. Oh, yes, the two anglers are Steve Martinot (left), assistant superintendent, and Alvin Campbell, machine tender, at the Bathhurst Company.

WHEN THE *Drums of War* ARE STILLED

With the coming of Victory will come Victory's products — astonishingly new, amazingly improved. Many of these achievements will emerge — are now emerging — logically and naturally — from one of the world's largest plants devoted exclusively to the manufacture of mechanical rubber goods — from 60 years of history-making invention and advancement and the vast proving ground of current war production. The BWH belting, hose and similar rubber products of tomorrow will outdistance in quality and performance the BWH products that the world accepts as the finest today.

BOSTON WOVEN HOSE AND RUBBER COMPANY

BWH

WORKS: CAMBRIDGE, MASS., U. S. A.

P. O. BOX 1071, BOSTON, MASS., U.S.A.

at a reduced rate of duty as straw wrapping paper is a question before the Custom officials. The Reciprocal Trade Agreement provided for a reduced duty on corrugating straw and strawboard, and the Canadian officials are endeavoring to determine what proportion of straw is required to justify the lower rate of duty.

Government officials have asked the Import Committee to assist in finding a market of about 12 tons of used creped wiping paper, used for wiping engraving plates in a Government establishment. The material is heavily impregnated with ink, which comprises nearly half the weight of this waste material.

◆

KVP HAS BOUGHT THE HARVEY PAPER PRODS. CO., STURGIS, MICH.

Kalamazoo Vegetable Parchment Company, Kalamazoo, Michigan, has purchased the Harvey Paper Products Company, of Sturgis, Michigan, manufacturers of a wide variety of paper products.

According to the announcement, the Harvey Paper Products Company will continue to be operated under its present name and with the same factory personnel, although present plans call for considerable expansion of the plant as soon as conditions permit. Harold C. Harvey, who, with his father, the late Alfred Harvey, organized the company in 1923 and since has been secretary and general manager, will continue as manager. J. G. Van Horn, who has been president and treasurer since the company moved to Sturgis from Wisconsin in 1926, is retiring.

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▶▶▶ INCREASING DEMANDS for the products of the Container Company, of Van Wert, Ohio, a division of Continental Can Company, Inc., has resulted in the purchase of a building from the Reading Iron Company at Reading, Pennsylvania. Carle C. Conway, chairman of the board and president of Continental Can, announced that the additional property "will extend the Container Company's facilities for the manufacture of Leverpak and Fiberpak fiber drums and barrels, used extensively for chemicals, pharmaceuticals, food, and various war products."

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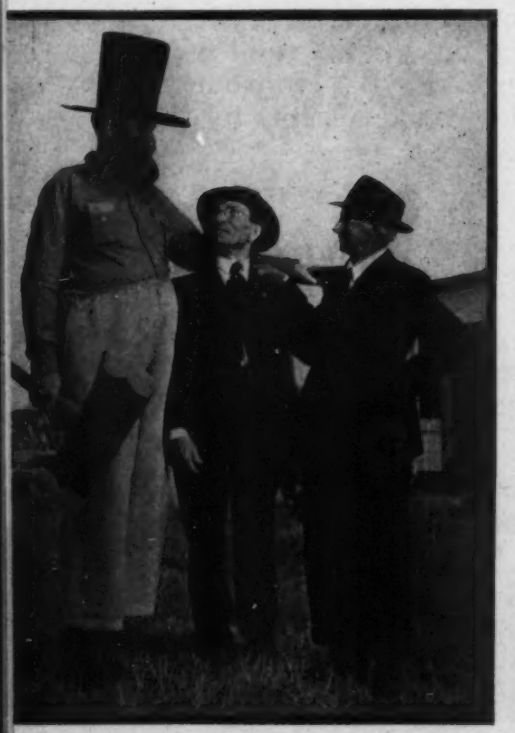
"PAUL BUNYAN" VISITS MINNESOTA FAIRS IN PULPWOOD DRIVE

The mythical Paul Bunyan, characterized through Len Costley, employee of Minnesota and Ontario Paper Company, Minneapolis, Minnesota, is appearing at county fairs in northern Minnesota, waging a strong drive on the present campaign to increase production of pulpwood sponsored by the Minnesota and Ontario Paper Company with the co-operation of the *Daily Journal*, International Falls, Minnesota.

In addition to organizing county committees in approximately 20 communities in northern Minnesota and staging various stunts, the *Daily Journal* has established close contact with wood-lot farmers through the media of the county fairs, at which the large statured gentleman, towering over six feet, talks to farmers, g i v e s them the pulpwood story, passes out free coffee and doughnuts, hands out souvenirs, and finishes his program by awarding a $25 War Bond as one of the closing features of the fair. He has appeared at the Lake of the Woods Fair at Baudette, on the Canadian border, and at two fairs in Koochiching County, the first at Littlefork and the second at Northome. His schedule likewise took him to the community of Cook for the annual Dairy Cattle Day August 28, and to Kelliher in Beltrami County.

Wood-lot farmers have shown a great deal of interest in the drive, and the *Daily Journal* hopes to increase the production of pulpwood to the point where the Minnesota and Ontario mills will keep operating throughout 1944.



Pulpwood production is urged by Paul Bunyan, recreated by Len Costley, of M. and O. Co., in conversation with two wood-lot farmers attending county fair, Baudette, Minn. Left—F. A. Peterson; Right—Alfred Randelin.

◆

NORTH GEORGIA PINE USED FOR PULPWOOD

The first shipment of north Georgia pine to be used as pulpwood in making many war-vital articles was sent from Chamblee to the Union Bag & Paper Corporation at Savannah. Heretofore, the mills on the coast have used pine from as far north as Griffin, but now, due to the necessity of getting 2,800,000 more cords of pulpwood, the territory has been extended to include Chatsworth, Ellijay, and Dalton. The new territory is expected to provide between 50 and 60 boxcar loads a week to coastal mills.

Tops of the pine, formerly left to rot on the ground or used for firewood, and trees not suitable for lumber can be used as pulpwood, the products of which are used in the making of smokeless powder, rayon for parachutes, food packaging, and other items necessary for the war.

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OSWEGO RIVER TISSUES LEASES KEUKA MILL

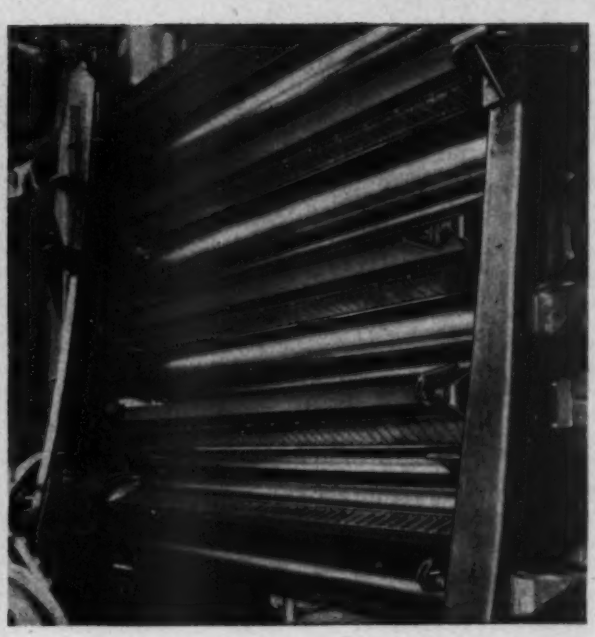
The Keuka Mill, Penn Yan, New York, has been leased by Oswego River Tissues, Inc., of Phoenix, and is being operated as the Keuka Mill division of the corporation. The mill has renewed operation after being shut down for two months when high water in the stream washed out the mill dam.

Under the new ownership, the mill will continue to operate as before, purchasing straw from local farmers as has been done for the last 78 years. The only manufacturer of straw paper in eastern United States, it will continue to produce a line of straw corrugating medium used in the making of corrugated board containers. Gary Dillon will remain as superintendent, and John E. Birmingham will serve as office manager.

◆

STUDY GIVEN TO LOG SINKING PROBLEM

With Canadian timber in demand for numerous essential purposes of the United Nations, Dominion govern-



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ment officials have revealed that scientists have gone to work to halt the wastage in timber due to logs sinking on long drives from timber limits to the mill.

Scientific study of the problem is aimed first at establishing the relation between decay and the buoyancy of timber. This investigation is being carried out co-operatively between the agriculture department's botany and plant pathology divisions and certain pulp and paper companies. Officials said there was little information available at present as to the floating properties of such wood, or as to what losses by sinking occur in sound wood in a given time.

◆

SWEDISH MEDIA CALLS PRESENT TIME THE "CELLULOSE AGE"

According to The American-Swedish News Exchange, Inc., New York City, the present war years will probably be known as the "Cellulose Age" of Sweden. This was stated recently by Gösta Hall, of the Swedish Cellulose Company, in pointing out that many new uses have been found for the forest products of Sweden. Cars and small boats are being run by fuel generated by the producer-gas system; clothing consists of about 50 per cent cellulose substance; cellulose is being fed to cattle with excellent results by being mixed with the regular fodder; "cellulose-beef" (a form of albumen yeast) is being served in Swedish restaurants, to mention a few of the new uses.

Inadequate imports of coal have put a heavy pressure on Sweden's forests for fuel. Although around 86,000 men were employed in the forests in December, 1942, as compared with about 70,000 in the same month in 1941, production has not increased, partly because the most accessible supplies have already been cut out and partly because food rations in Sweden are so small that even with an increased allowance to heavy workers, it is increasingly difficult for the men to do the strenuous work in the forests.

It is generally expected that the economic situation of the cellulose industry in Sweden will be more difficult during 1943. The production of cellulose fodder will probably fall off, as the harvest of hay has increased in the last two years. A decrease in the export of artificial silk pulp is also likely.

With the present shortage of fats, oils, tars, and similar materials, the by-products of the pulp and cellulose industries have sometimes become of more importance than the main product itself. While it has been suggested that production be confined to such factories as have high output of these by-products, this has been prevented because of technical reasons.

The practice now followed is to run all such factories at a rate of production that exceeds the actual need. Thus, reserves for postwar export are provided at the same time that the demand for wood alcohol, etc., is being met. The outlook for the resumption of large-scale pre-war export is considered very uncertain, chiefly because of the increase in production in the United States and Canada.

◆

TO CONSERVE FUEL OIL USED ELECTRIC BOILERS HAVE BEEN INSTALLED

As an emergency wartime measure to conserve fuel oil, the Powell River Company, Ltd., Powell River, British Columbia, is installing a second-hand electric boiler in the steam plant.

Due to wartime regulations, the plant is at present operating on a curtailed production basis, with the result that the electric power load required by the mill is considerably decreased, and the company's hydro-electric developments at Stillwater and Power River are not being utilized to full capacity. The surplus power will be used to displace fuel oil for the generation of steam as soon as the boiler, purchased from the Kenogami mill of Price Brothers & Company, Ltd., where it has been in service for many years, is put to use.

◆

WESTON HAS PURCHASED J. R. BOOTH, LTD.

W. Garfield Weston, industrialist and Canadian-born member of the British Parliament, purchased J. R. Booth, Ltd., Ottawa, with the exception of its lumber division, according to an announcement by J. Gordon Fleck, vice president and managing director. The purchase price has not been disclosed. Mr. Weston recently purchased the E. B. Eddy Company, of Hull, Quebec.

A new company, Booth Lumber, Ltd., has been formed to take over the present lumber division of J. R. Booth, Ltd., consisting of sawmills at Ottawa and Tee Lake, Quebec, and extensive sawing limits in Ontario and Quebec. Head office of the new company will be at Tee Lake, with the following officers: chairman of the board, C. J. Booth; president, Mr. Fleck; vice president and general manager, K. O. Roos; and sales manager, C. R. Doney.

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. . . . . Editorial . . . . . .

The Possibility of a Drastic Paper Shortage

▶▶▶ THE STATEMENT "War has increased the demand for paper, not only for direct purposes, but to replace critical metals like steel, and tin, etc." was made recently by Representative Clarence J. Brown (R., Ohio), a member of the Special House Subcommittee investigating newsprint and pulp shortage. Representative Brown further pointed out that a potential shortage of 3,750,000 cords of pulpwood in the United States and Canada probably would force a 30 per cent cut in the amount of newsprint and paper available for newspapers, books, and magazines.

This shortage of pulpwood was envisioned in an editorial in the January, 1943, issue of this magazine where it was stated: "Unless immediate steps are taken to make certain the continuous flow of pulpwood to the mills of this country, a critical, crippling shortage of paper products will certainly face the Nation during 1943."

On August 18, the American Paper and Pulp Association in a news release, said that immediate action by the War Manpower Commission is necessary to avert a drastic shortage of paper in the United States which might gravely affect the national economy. Likewise, according to the release, decreased output, basically, stems from manpower shortage in pulpwood cutting areas.

Will the immediate action suggested by the Association be forthcoming? It is not believed so; because the War Manpower Commission, months and months ago, took so many of the qualified men from the cutting areas, or allowed them to leave for more productive employment.

Suppose the War Production Board had not declared steel as essential to the war effort, and all of the hardy miners had been drafted into the armed forces or had been allowed to quit mining and go into higher wage paying industries? Had this happened, where would the steel industry and the war economy have been today?

How different would be the present situation in the paper industry had its essentiality been declared much earlier than it was. Recognition of this problem by the War Production Board came much too late.

Unless some means can be made effective very quickly to increase the pulpwood cut, and it is granted that definite progress is being made in that direction, the United States will be faced with a drastic paper shortage.

When Winter Comes

▶▶▶ WITH THE PASSING OF Labor Day it is difficult to keep thoughts of approaching winter out of mind. In only a few short weeks, cold weather will come to many of the pulp and paper mills of this country.

These mills, in normal times, must prepare for the winter months, but now it is doubly important that they do so.

There are many jobs to be done. Everything out-of-doors must be put in shape to minimize any chance for trouble.

A careful inspection of all outside operations and general conditions outside the plant should be made by every individual mill to ascertain where attention is needed. Nothing should be overlooked. Mill roofs, mill windows, all fire hydrants and water towers, walkways, driveways, outside lighting system, and every item of mechanical equipment located out-of-doors should be carefully checked. Condition of the mill yard should be observed. In fact, anything connected with mill operations that is not protected by mill buildings should come in for the inspection.

Wherever there are water pipes or steam mains which might freeze, protect them.

If yard lighting is in bad state of repair, get it into condition. With less hours of daylight during the winter months, better yard lighting is essential to safe operations.

Likewise, an untidy yard, which may not be responsible for any accidents in warm weather, may become a real hazard during the winter months. The hazard comes from snow and ice actually hiding objects that may be responsible for causing accidents. A clean yard is a safe yard in which to work and through which to travel.

A leaky roof this winter may be not only inconvenient but expensive as well—it may be responsible for product spoilage; it may cause a delay in production; it may develop a safety hazard. If a roof looks as if it might need a repair job before spring, do it now.

Coal is needed to fight the war . . . not to heat the out-of-doors. Warm air from within a mill building passing to the outside through broken windows is so much coal just thrown away. Put all windows in good shape and save coal where possible.

Safe walkways and driveways are every day necessities. Yet, seldom do these avenues of traffic receive the attention and care they deserve. Remember that an accident lurks in every unsuspecting place. Repair any walk or driveway where the condition is such that an employee might stub his toe and fall. Oftentimes, the little fall is a serious one—a broken wrist, or leg, or possibly something more serious. Do not let production lag, because of carelessness in maintaining walks and driveways. There would be no excuse for it.

Individually, each of these jobs and many others which might be mentioned seem trivial. They are so easy to overlook; however, attention to these small but important maintenance jobs will effect economies in mill operations by minimizing industrial hazards, by preventing unnecessary shutdowns, by reducing spoilage, and by building employee morale.

Correcting Some Misconceptions

▸▸▸ IN AMERICA TODAY there is not enough food to satisfy the demands at home and abroad. There are definite shortages of several of our favorite foods. That is fact No. One. Fact Number Two is that food has never before been so important. The course and the length of the war depend on it. It can shorten the war; it can write the peace; and if, when it does the latter, the supply is great, we can obtain the best peace.

In order to bring about true consideration of food, this article is devoted to the correction of some misconceptions regarding food. Most of us have heard or read articles in the newspapers, regarding this Nation's tremendous production of food stuffs. The mathematically-minded man with the prodigious memory will recall that this year (1943) the Nation will produce approximately 57 billion eggs — 57 billion quarts of milk — 30 million cattle and calves — 24 million sheep and lambs — 4 billion pounds of chicken, dressed weight—19 billion pounds of pork, dressed weight, —3 billion pounds of lard, etc., etc. Naturally such staggering and uncomprehensible figures (obtained from the War Food Administration) lead directly to the misconception that America is the land of milk and honey. We produce large surpluses of food — far beyond our ability to consume them. Whereas the fact is: New records for food output have been achieved every year for the past six years, BUT we do not have enough food in total to satisfy today's stepped-up demands for food (1) for war purposes, and (2) because of the tremendous increase in civilian purchasing power.

Other misconceptions and their opposed facts might be listed as follows:

"We civilians get only the left-overs, after allotments are made to others."

American civilians will actually get *three-fourths* of the supply for the next twelve months, and this allotment is second only to the requirements of our Armed Forces.

"We are sending too much food to our Allies."

Our Allies could not keep up their stamina and fighting strength without our food. However, we are sending them only 10 per cent of our food production — and they could use much more.

"Our armed forces get most of our food."

Our Armed Forces today are getting only 13 per cent of the total. Of course, it must be obvious that this percentage will increase as the War progresses, due to enlarged forces and increased losses en-transit.

"We've taken on the impossible job of feeding the world."

We're taking on only a limited food supply job which we *can* perform, to save the lives of American fighters — to shorten the war — to help the liberated countries help themselves. This job may conceivably increase as more occupied countries are liberated, and sheer starvation must be averted. There are few in America today who begrudge the food we sent to Belgium after the last war, for distribution by the Hoover Food Administration.

"Rationing and price ceilings are unnecessary."

Control *is* necessary . . . to see to it that everyone gets an opportunity to obtain his fair share of foods in short supply . . . and to hold prices down.

"We civilians can't do anything about food prices."

Food prices *can* be kept within reasonable limits, through civilian co-operation; i.e., learning top legal prices and never paying more.

"The Armed Forces waste too much food."

Probably the Armed Forces *do* waste some food, but the civilian population, even today, wastes annually almost enough to feed the larger part of our Armed Forces both at home and abroad. Did you ever examine the garbage can in the alley behind your own and neighbors' homes? Did you ever see the garbage containers of a restaurant or a hotel? The Armed Forces themselves have reduced waste to an unprecedented low, and are continuing this trend.

"The food situation will get ironed out soon — and we'll be able to eat as we always have. A little side (black market) purchasing won't hurt."

The food situation will not "get ironed out" even with the final "unconditional surrender." It will continue to be a situation for months, if not years after the war has ended. Rationing, in a constantly changing pattern, will continue for the duration, and the "duration" means through the period of postwar readjustments. We will be called upon to adjust ourselves, and to keep on adjusting. Sneaking side purchases only delays the time when normal purchases *can* freely be made.

"With each victory abroad, we'll have more to eat at home."

With each victory, we'll actually have less of some foods. We will feed the peoples of some countries thus freed from Axis domination. And that, my dear sir, is a very cheap way to lighten the tasks of our occupying soldiers and marines. By temporarily feeding foreigners, we keep down riots, rebellion, civil strife — and prevent our own American boys from being killed or wounded in such needless fracas.

The civilian is going to be fed well enough for health and strength, yet not well enough to permit needless (and accustomed) waste. Nothing to be unduly alarmed about. This is *not* a scare article, nor a frightening subject. It merely analyzes a situation which must be met calmly, wisely, realistically, sanely, and co-operatively.

HOW TO MAKE CHAINS AND SPROCKETS RUN BETTER.....LAST LONGER

1 Keep shafts exactly parallel, and wheels exactly in line. Misalignment causes uneven loading and unnecessary wear.

2 Remove chain frequently and clean thoroughly in some solution to wash out harmful dirt and grit. Then immerse in oil.

3 Protect chain and wheels from needless exposure to abrasive materials, dust and dampness. Use oil-tight casings with high-speed silent or roller chain drives.

4 Inspect shaft bearings by removing grease from bearing ends to expose the actual bearing metal. Rebabbitt if needed.

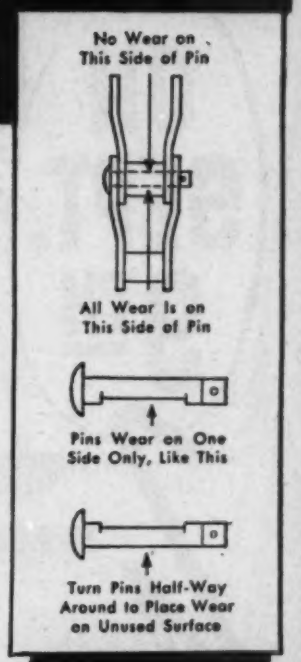
5 Flush ball or roller bearings periodically with fresh grease to drive out foreign matter and replenish the seals. In dusty atmosphere or dirty locations, use auxiliary dust seals.

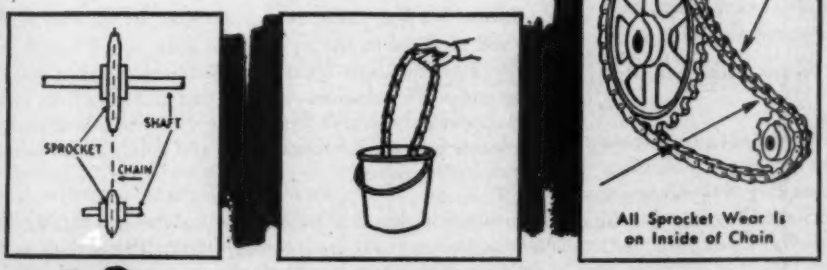
6 Check machinery supports for vibration and reinforce if necessary.

7 Operate chain with a little more slack than normal for a flat belt. Tight drives wear chain and sprockets needlessly.

8 WHAT TO DO FOR WORN CHAIN

Turning a chain over so that the opposite side contacts the sprockets is a quick and easy means of restoring the original backing dimensions on cast pintle chains. On roller chains of either cast or steel fabricated types, this same simple operation will bring practically new surfaces into play under the rollers. In designs where pins are locked against rotation, wear is confined to that side against which the next link is held under tension. Rotating these pins 180°, places articulation action upon a practically unused pin area and, as far as the pins are concerned, restores original pitch. Bushed type chains afford another opportunity for pitch correction by reversing the bushings or rotating them 180°, but this involves the dismantling and reassembly of heavy press fits and should be avoided except as a last resort.


No Wear on This Side of Pin
All Wear Is on This Side of Pin
Pins Wear on One Side Only, Like This
Turn Pins Half-Way Around to Place Wear on Unused Surface



9 WHAT TO DO FOR WORN SPROCKETS

Cast-tooth sprockets, particularly in the larger diameters, frequently can be reversed on the shaft to bring chain barrels, or rollers, into contact with unworn root-diameter surfaces, but worn root-diameters on all types may be built up by welding and grinding smooth to fit the chain. Should wear have deformed the teeth of cast-tooth wheels into a hook-shape, these hooks may be ground off, or the wheels reversed.

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For this extra money must be raised *in addition* to keeping the already established Pay Roll Allotment Plan steadily climbing. At the same time, every individual on Pay Roll Allotment must be urged to dig deep into his pocket to buy *extra* bonds, in order to play his full part in the 3rd War Loan.

Your now *doubled duties* call for these two steps:

1. If you are in charge of your Pay Roll Plan, check up on it at once—or see that whoever is in charge, does so. See that it is hitting on all cylinders—*and keep it climbing!* Sharply increased Pay Roll percentages are the best warranty of sufficient post war purchasing power to keep the nation's plants (*and yours*) busy.

2. In the 3rd War Loan, every individual on the Pay Roll Plan will be asked to put an *extra two weeks salary* into War Bonds—over and above his regular allotment. Appoint yourself as one of the salesmen—and see that this sales force has every opportunity to do a real selling job. The sale of these *extra* bonds cuts the inflationary gap and builds added post-war purchasing power.

Financing this war is a tremendous task—but 130,000,000 Americans are going to see it through 100%! This is their own best *individual* opportunity to share in winning the war. The more frequently and more intelligently this sales story is told, the better the average citizen can be made to understand the wisdom of turning every available loose dollar into the finest and safest investment in the world—United States War Bonds.

★ ★ ★

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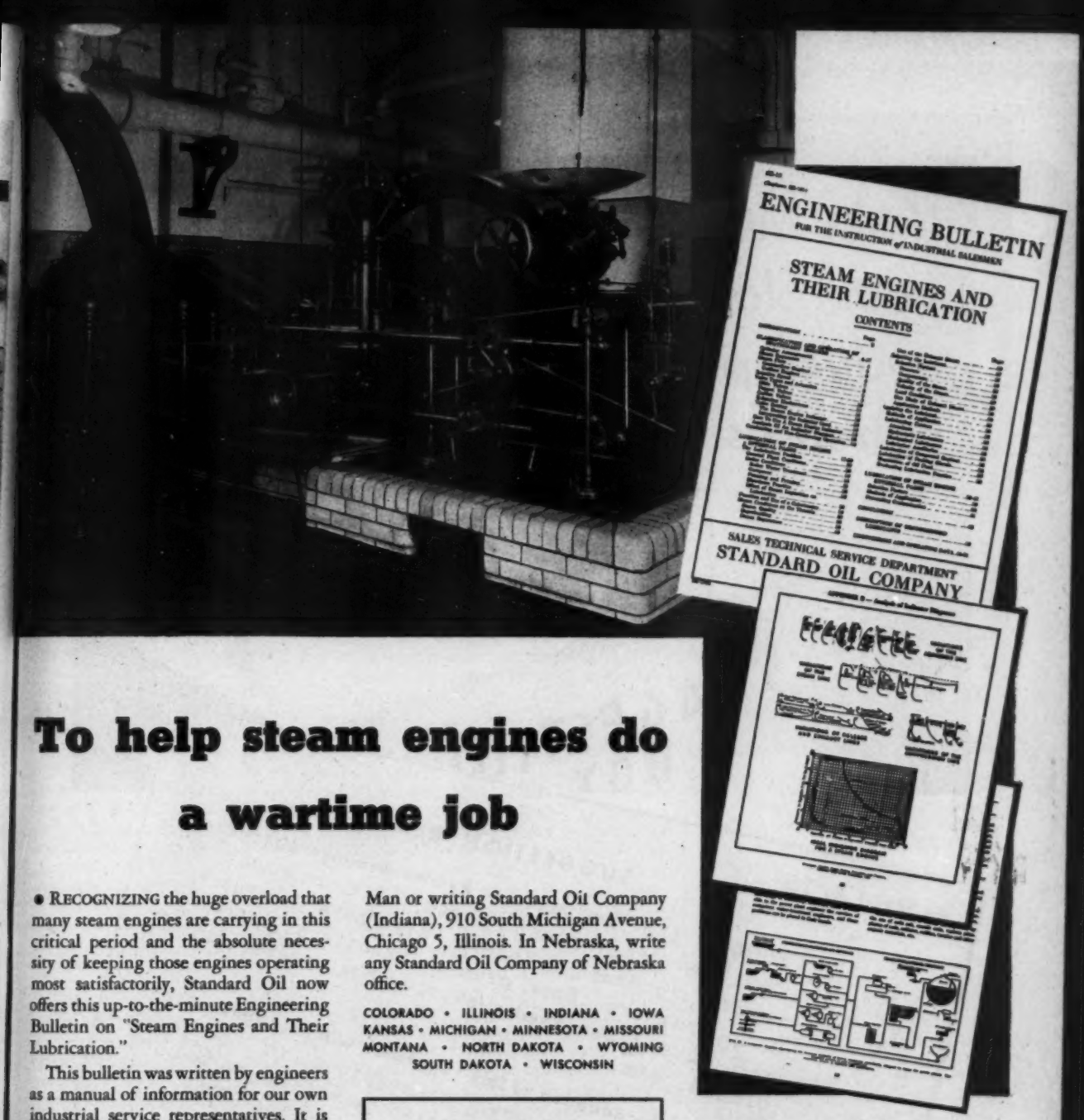

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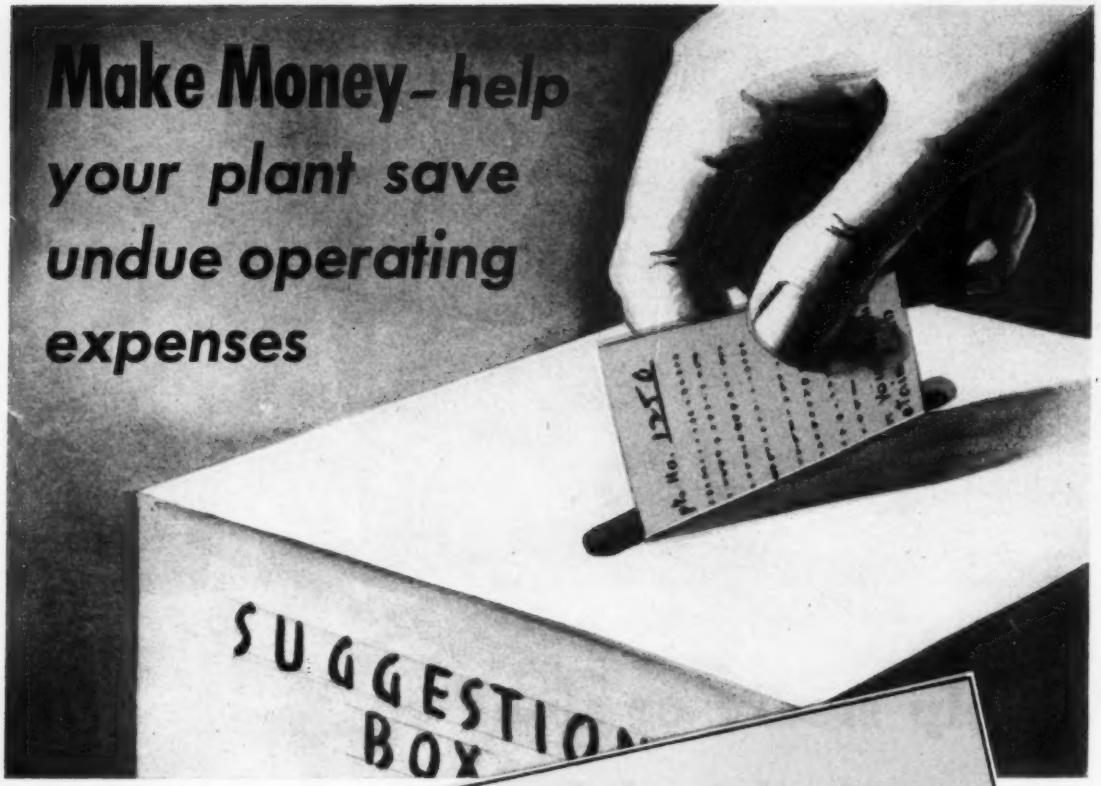

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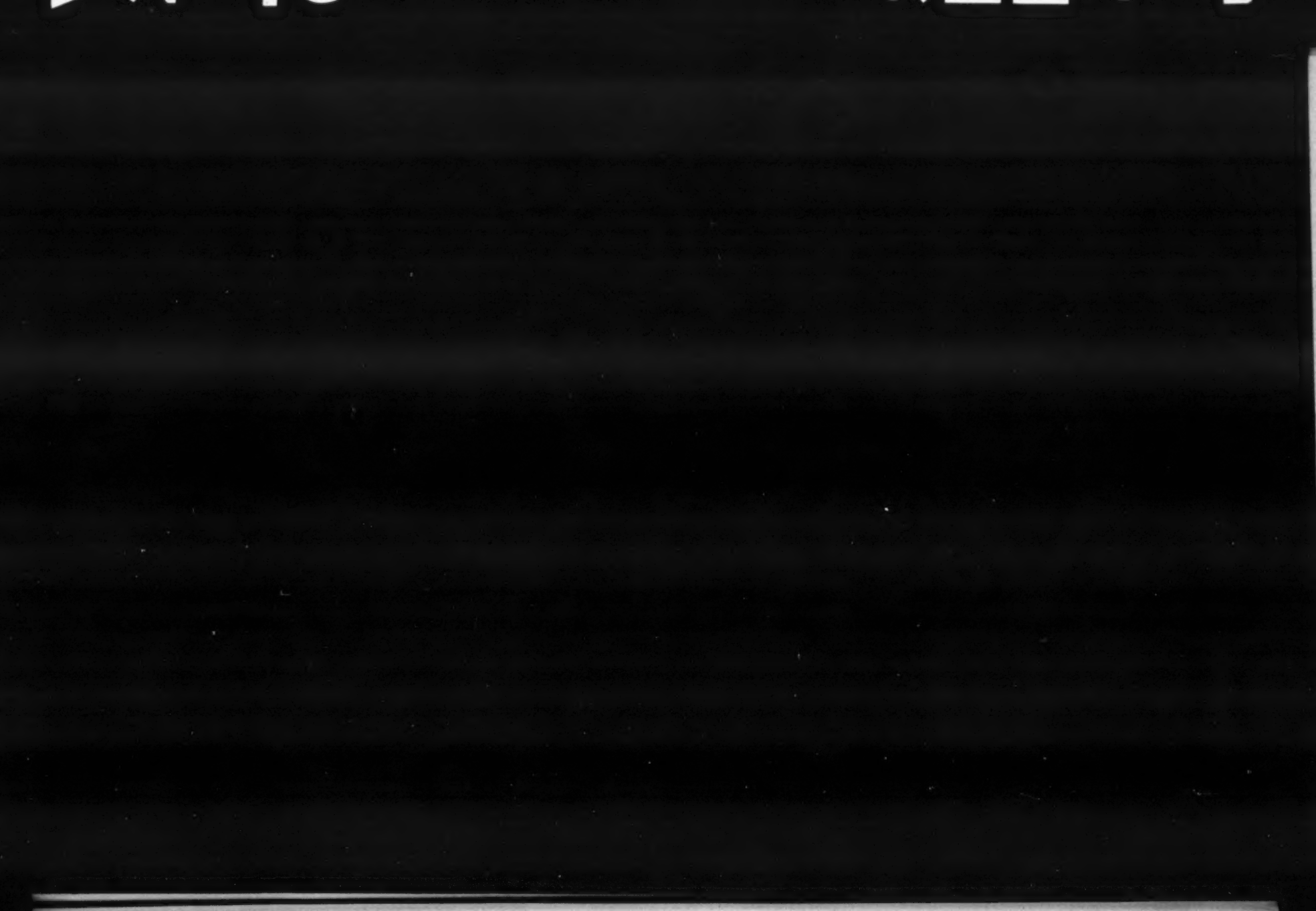


Care of the Wire

ARCHIE McCAFFERY

▶▶▶ TAKING CARE OF THE WIRE is one of the most important responsibilities of a machine tender. A wire can be damaged or spoiled easily by lack of knowledge, by carelessness, or by rough handling. To keep out of trouble, a machine tender must avoid mistakes.

One of the first things that should be done after starting a wire is to inspect the operation of the wire guide. If the guide has to work to keep the wire from running off, the machine tender must determine to what extent the wire tends to skid. If too much, the wire should be stopped and checked by hand rather than wait until the wire is off the machine before doing anything about it.

At times, a wire, when carrying no stock, may be hard to keep on; yet it may operate fairly satisfactorily when stock is on it. This condition may be due to the wire itself, or it may be caused by some part of the fourdrinier being out-of-distance or out-of-level. To meet such a condition, the machine tender should adjust the guide sufficiently to compensate for the pull before starting the wire.

The operation of the guide roll also must be observed by the machine tender upon starting the wire. The motion of the wire furnishes the power to turn the roll. If the wire is slack, the roll may not start with it. In a situation of this kind the wire is apt to run off the machine.

The machine tender should thoroughly understand the automatic guide. He should be familiar with all of its operating characteristics. He should know how to set it. He should know what not to do when it is running properly.

If it were not for the wire guide, the wire would not stay on the machine. Conversely, the guide may be responsible for a wire running off the machine.

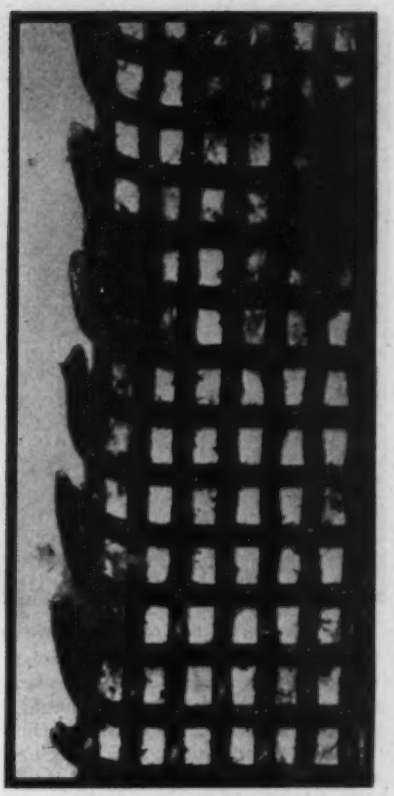
To explain this antithesis: consider a wire that is hanging quite badly to the front side because of a localized suction box drag on it. The front edge of such a wire will push against the pan of the wire guide, which, in turn, will cause the controller wheel to turn a little at a time. This turning of the controller wheel moves the front box of the guide roll possibly as much as two inches. Movement is toward the couch, if the guide is set on the top wire; toward the breast roll, if set on the return wire. It is this movement that keeps the wire on the machine.

Now suppose, with the guide roll in this position, that a chunk of grease should accidentally lodge on the dandy roll. With every turn of the roll, the grease would cause a hole to be put in the paper. Holes thus made would release the drag on the suction boxes and thereby eliminate the need for the guide roll taking its position.

Because of its position, however, the roll starts the wire to the back side of the machine. The pan of the guide follows the wire edge against which it is leaning. The controller wheel works to get back on center.

In a situation of this kind, no guide functions fast enough to prevent the back edge of the wire from getting over the ends of the rolls on the back side of the fourdrinier. If that wire isn't stopped, it will be ruined.

Similarly, maintaining the same premise, anything that will permit air



Pickets jammed by hard riding guide pan. A cause of edge cracks.

to enter the suction boxes or that will cause a loss of vacuum in the boxes will cause the wire to run off the machine. It may be brought about by the blowing of a fuse in a starting box, the breaking of a suction pump belt, or the failure of a half stock pump to deliver stock to the machine.

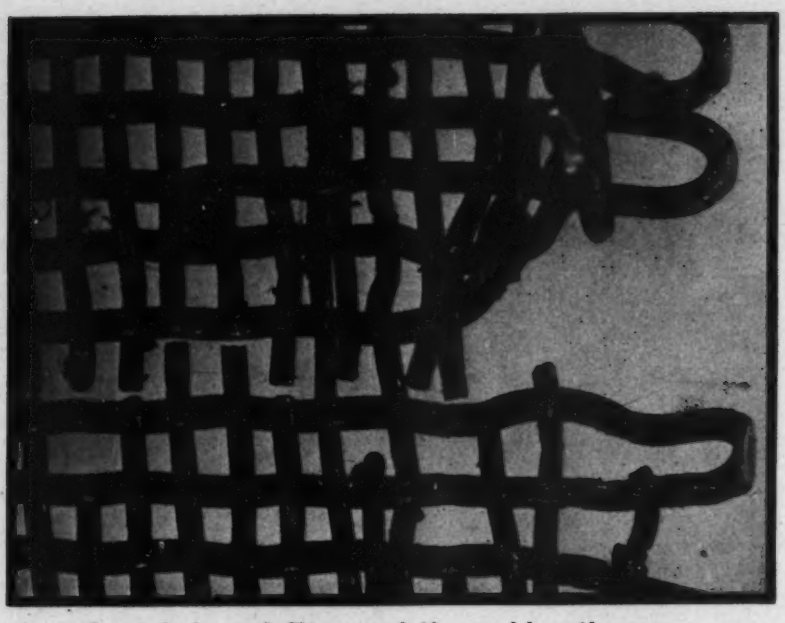
It might be argued that the guide should be geared to work faster; but a wire guide cannot be driven fast. Rapid speed dulls the fork and breaks off the dogs.

If a dog breaks, the guide will not work. If the teeth in the index or controller wheel become dull, neither fork nor dog will catch properly in the wheel. If either the fork or dog becomes dull, it will not catch in the controller wheel. In any such situation, the result is the same—the wire will run off if the machine tender isn't on the job.

The screw of the wire guide commonly is held in place with set screws. If for any reason, the set screws do not hold, the screw will turn and, in so doing, let the wire run off the machine. To prevent this situation, the screw should be keyed.

Screws also are used to hold the brackets and push rods in place. Here again, many a wire has run off machines and spoiled because of such screws becoming loose.

EDITOR'S NOTE: The illustrations used with this article were supplied through the courtesy of The Lindsay Wire Weaving Company, Cleveland, Ohio.



A typical edge crack. This one probably caused by guide pressure.

The machine tender, running to the wet end in a break, first of all, should observe the position of the wire. He should know how much wire ought to show on each side of the sheet. If it has partly run off to one side, he must decide whether or not to stop it. If the wire has run over the ends of the rolls, a shut down is necessary.

It isn't always necessary to shut down in case of a broken dog if the fork is of proper design. Neither is a shutdown always necessary when a set screw becomes slack in the controller screw or in a push rod. However, unless the machine tender is certain that he can make the necessary changes while running, it is best to stop the wire.

The index wheel is prevented from turning too easily by a spring which acts as a brake. If the spring becomes dead, the guide will cease functioning. A useless spring is indicated when the fork, upon its return from pressing against the index wheel, pulls the wheel back with it. To keep a machine running with a guide in this condition, it is necessary to check it by hand.

If for some reason the wire stalls when running a suction box with a thin cover, the weight of the atmosphere on the cover may split it. The split of itself need not damage the wire; yet it will do the wire no good.

The thickness of the suction box covers should be known to the machine tender at all times. If he knows that he has a thin cover, he will expect it to split in case the wire stalls and will be prepared for it. He will sink this cover before starting again. On the other hand, if he is not aware of a thin cover and starts the wire after a stall with vacuum on that suction box, the wire will be spoiled.

If the covers are not injured upon the stalling of a wire and the machine is equipped with a suction couch, the stock on the wire may be removed by lifting the lump breaker and running the stock into the save-all. Necessarily, the vacuum in the boxes will have to be released. This job may be done by holding up the front edge of the wire at the suction boxes with the palms of the hands.

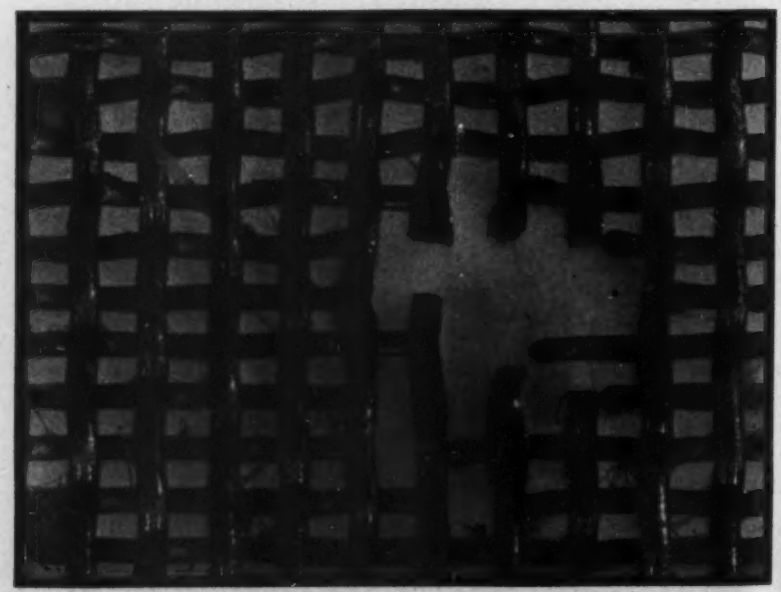
If the machine has a top couch and the stock on the wire has been disturbed after the stalling of the wire, this procedure will not suffice because of the uneven thickness of stock film on the wire. In such a case, all of the stock will have to be squirted off the wire before starting it again. However, if the stock on the wire has not been disturbed, the weights may be taken off the couch, the sides of the wire held up, the wire started, and the stock run through the couch. In either case, if vacuum is created through the use of a unit vacuum control system, each box will have to be released separately before starting the wire.

Water from a pressure hose applied to a wire that is slack and has become worn will put wrinkles in it.

Any carrier roll out-of-distance or out-of-level will permit a wire to wrinkle. If everything is running satisfactorily, a roll may be out considerably without doing any harm. However, if for some reason the stretch roll has to be tightened, it puts more bearing on all rolls and a wrinkle may develop. To prevent such an occurrence, the carrier rolls should distance at all times.

A carrier roll that is out of level beneath the save-all of the table may run without ill effects until water, which is put on for starting, overflows the save-all. Then the large volume of water falling on the wire in the vicinity of the carrier roll which is out of level may put a wrinkle in the wire. The rolls, therefore, should be kept level to prevent this possibility.

Moving a hand guide may wrinkle a wire through the incident movement of the guide roll. Therefore, the machine tender in making such an adjust-



The result of a lump of stock getting under the wire.

Wire marked and cut by objects being dragged across the wire.

ment should watch its effect on the wire. The wire will draw badly before going into a wrinkle. If the draw looks bad, ease up before the wire starts wrinkling.

A few other causes of wire wrinkles are:

Running heavy stock through a couch, after a wire stalls, without taking off the weights.

Save-all filling with stock and the stock contacting the wire.

Crushed paper running in front of the couch roll because the dandy is picking up the sheet, or because flat box vacuum is lost.

Flimsy wire pole in stringing new wire.

If wire wrinkles caused by running heavy stock through a couch, after a wire stalls, without taking off the weights are to be avoided, be sure to lift the weights before starting up with heavy stock on the wire. If the save-all fills so that the stock contacts the wire, shut down. If the dandy is picking up the sheet, clean the dandy. If flat box vacuum is lost, pull the slide, shut down and lift off the dandy. If a flimsy wire pole is responsible for wrinkles, destroy it; and use a stiffer pole.

Sometimes the shake is blamed for putting a wrinkle in the wire. The author's experiences, however, has not substantiated this cause; since, in a number or instances where wrinkles have been laid to the shake, later discovery revealed them due to something else.

Pounding on the slices and deckle frames should not be permitted. It is a foolhardy practice that may cause a frame to be pounded out of shape or broken rivets to fall on a wire. If a frame is bent at the place where the slice bracket is riveted on, the slices cannot be made to work properly again. Usually a deckle will pull out or shove in easily if the nut in the center of the slices is slackened to permit it.

Wires often have been damaged by tools or tacks which have been left on the apron. It should not be necessary to caution against this practice.

Sometimes a very hard object accidentally passes through the couch and, in so doing, scars the bottom roll so deeply that a plug has to be inserted. To do this job, a hole is drilled in the shell to eliminate the scar. Next, the hole is threaded, and a plug of the same metal composition as the shell is screwed into it. Then the roll is buffed to give a smooth, continuous surface. If the general surface of the shell wears away faster than the plug surface, in time the plug will project sufficiently far from the roll face to ridge every wire installed on the fourdrinier. Such a roll must be taken out and buffed if wire ridging is to be stopped.

In running a save-all next to the breast roll, a doctor or wipe is installed against the breast roll to keep stock from gathering on it. The doctor or wipe must be fitted properly if wire ridging is to be avoided.

If doctors are not run on the inside rolls and white water is used in the showers, all parts of the showers must be kept open. Otherwise, the rolls will coat over, thus ridging the wire. The extent of the ridging will depend on the amount of the coating and the tension of the wire.

If the wire is stuck to the flat boxes, too much suction will ridge the wire. In a case of this kind, the suction on the last box should be shut off until the oscillator is started. If the machine is not equipped with an oscillator, it will be necessary to move the boxes by hand until the wire starts to vibrate on them. If the wire cannot be made to vibrate in this way, the cover of the last box should be planed. Planing of this cover will stop the wire sticking.

Bad lumps in the jacket is another cause of wire ridging. To eliminate this trouble get rid of the lumps and their cause.

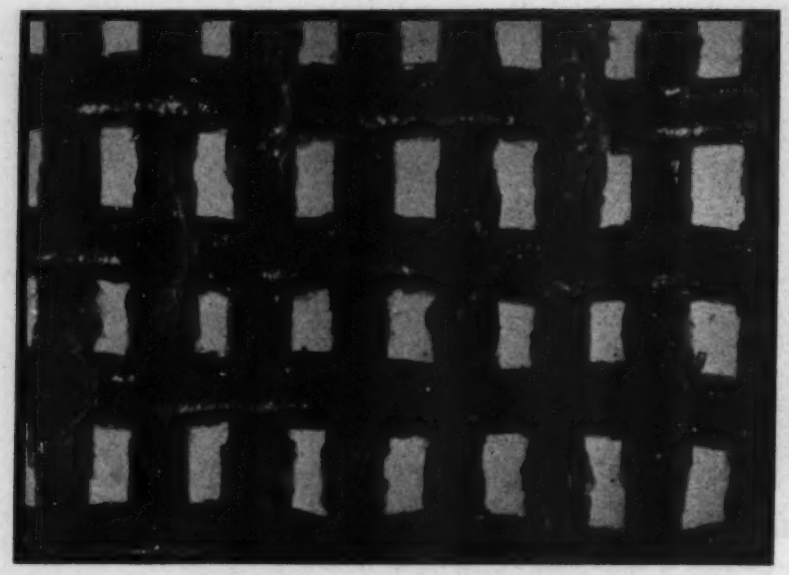
Often the last table roll is not equipped with a doctor. If the water jet used for trimming the edge of the paper is set too near this roll, it will spatter stock upon it. An accumulation of this stock will cause the wire to ridge.

Likewise, if stock is following the edge of the wire, it will gather on this roll as well as on the bottom couch. If the cause of this condition cannot be eliminated, it will be necessary to keep a close watch of the last table roll and even a closer watch of the couch. Otherwise, the edge of the wire will be spoiled.

On some grades, the last table roll cannot be run without a doctor because the stock adheres to it. In all such cases, the only remedy is a doctor on the roll.

It should be mentioned that an accumulation of stock on any of the carrier rolls will ridge the wire.

If a wire has ridged because of being stuck to the last suction box, the machine tender often can remove the ridge by placing his fingers against the top of the paper over the ridge and pressing them down firmly. Such ridges have been removed in this manner by the author when they were so pronounced that the wires looked



Mill scale on wire—probably from size.

spoiled. The use of a spoon to remove a ridge will not give satisfactory results.

A lump breaker on a suction couch will cause ridges in the wire, if it is left down while shutting down or if it is left down in the process of starting up. In either case, the roll becomes unevenly coated with stock, hence the ridging. To prevent the ridging of a wire from these causes, do not operate a lump breaker except when stock is on the wire.

When running a double couch, a worn-out straight edge will allow a lump the size of a hen's-egg to gather, and when this lump lets go it will cause a slack spot in the wire. A straight edge ceases to merit the name when it gets in this condition.

A deckle strap often is turned over in the act of starting. If there isn't enough clearance, a slack spot in the wire will result.

Weights and irons, placed behind the slices to draw currents, have been known not only to put slack spots in a wire but also to ruin it. An iron behind the slices narrower than the space between the wire and the slices should never be allowed, and weights should be kept back so that they do not bear on the wire.

In putting on a new jacket, care must be taken not to cut across the face of the old jacket before the top couch is lifted, otherwise, slack places will be put in the wire.

Sewing thread left on the wire also may be responsible for causing a slack place. To prevent such a slack place from developing it is simply necessary to remove all unused pieces of thread from a wire after a sewing job has been completed.

If either a wrinkle or a slack spot gets into a wire, it may not break the paper; but it will mark the sheet, thus rendering the paper unsalable. The best procedure for removing a wrinkle or a slack spot, when such a repair can be made, is as follows:

1) Shut down machine
2) Shut off wire and jacket showers
3) Place a sizeable wad of wet broke on each end of jacket
4) Make up solution of vitriol (copper sulphate) in suitable pail—about ¾ water, ¼ vitriol
5) Start the wire and turn vitriol solution onto jacket
6) Allow wire to run a minute or so, and then stop it
7) Scrub surface around slack spot or wrinkle with a wire brush.
8) Tighten down wire and start up again

If running a suction couch, the wire may be soured evenly by placing the vitriol solution in a wood box of suitable design that has been shoved up under one of the bottom carrier rolls.

A strip of felt often is used to pound out a slack spot in a wire. This practice, however, is not as satisfactory as the procedure just previously described.

One of the first symptoms of old age in a wire is a crack. Usually a wire will commence to crack on its edges. A crack on the edge seldom is sewed if there is sufficient wire to permit trimming. The sewing of a crack on the edge usually invites more sewing on the edge elsewhere as other cracks develop. If the edge is trimmed, all of this sewing is unnecessary.

Trimming a wire is not difficult; the important thing is to do it right.

After the seam has been brought around to the table, the blade of a jackknife should be run through the wire (either in front or behind the seam) at the desired distance from the edge to give the width of strip to be taken off. Then the seam may be cut through and the strip started.

To complete the operation an assistant is necessary. The wire must be run slowly while the strip is torn off. Otherwise, there is danger of the wire tearing in. No chances should be taken with this hazard in trying to do a fast job.

After the seam has passed the guide pan, the wire should be stopped to permit adjustment of the wire bracket so that the pan will lay against the new edge. Then the trimming operation can be resumed and continued until it is around to the seam or starting place.

When the strip has been torn off, it is necessary to pull out the five outside warp threads for the entire length of wire. If less than five threads are removed, it may mean a shutdown later for further wire repairing.

A small crack along the edge of the wire sometimes is simply cut out. This practice is not objectionable for a crack on the back side of the wire, but it should never be followed for a crack on the front side. In the latter case, if such a cut out is made, every time the opening in the wire made by it reaches the guide the pan will fall into it. The front side should be trimmed its entire length; and so should the back side. There is no permanent gain in cutting out a crack as other cracks caused by the same thing that caused the first one often will develop at other points along the edge.

Speed is the prime requisite in sewing a wire, but speed requires practice, and the finer the wire the more difficult it is to sew.

It is not necessary to do as artistic a job in the sewing of an ordinary crack on the wire edge outside the sheet as might be required farther in on the wire where the stock runs. If the crack is on the edge, the wire might be run around until the crack is at a convenient place on the table to be sewed. Then, while in this position, a handful of wet broke may be placed on the tube roll on each side of the crack as a support for the wire. The wire is then ready for sewing.

To do the sewing job, about twelve inches of wire are pulled out of a spool of special sewing wire. The pulling is accomplished by taking a short hold on the wire near the spool, pulling hard but slowly until it parts. This technique draws out the end of the wire which separates from the spool and makes it easier to insert into the mesh of the wire being repaired.

Insertion into the mesh is made through the top and at a slight distance farther in than the crack. When the wire is through far enough to grip it strongly with the fingers, it is pulled through sufficiently to allow a knot to be tied. After tieing the knot the short protruding end is cut off, and the knot brought up against the bottom side of the wire.

The first stitch may be straight. It should not be over 3/8 of an inch long. A long stitch will not run any length of time; it will break.

The herringbone stitch is used for making the rest of the stitches. This stitch is made by pulling the thread up through the crack after every downward movement.

Alternate stitches should be of equal length to the first stitch. The remaining stitches should be shorter. In this way all of the strain will not be on one cross-thread of the wire.

Sewing should be continued until the edge of the wire is reached. Then the immediate edge may be reinforced by a number of rather long stitches made close together.

The sewing of a crack in the middle of the wire is started in the same way as for an edge crack. A hook, however, is needed to pull the thread up through the crack to enable the sewer to tie the knot. Such a hook can be made from a hat pin simply by heating one end with a torch, curling it up, and then placing a wood handle with one flat side on the opposite end. The flat side on the handle allows the machine tender to know the location of the hook simply by feeling with his thumb.

After the knot has been tied, the short protruding end is cut off. Then the knot is drawn down through the crack and up against the bottom of the wire. Sewing is continued until the middle of the crack is reached. Then the thread is cut off even with the wire surface. The other half of the crack is completed in the same manner as the first.

A few points to remember about sewing a wire are:

1) Long stitches will break

2) Sewing too closely will cause the sheet to crush, if running a double couch

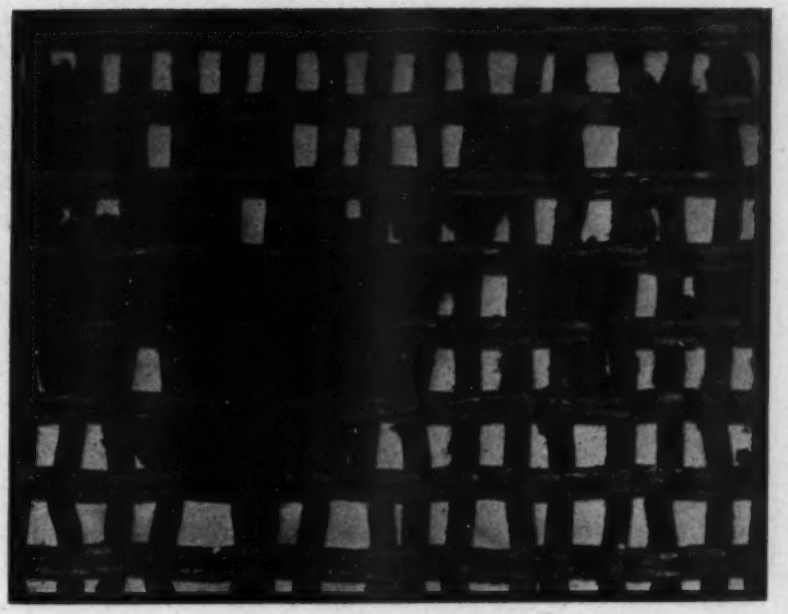
3) A kink in a sewing wire spoils it for further use

4) Cutting off the thread with a knife blunts the end so that it will not go through the mesh of the wire

5) Sewing too lose will leave a hole in the paper

6) Slack threads will break off

Unfortunately, all cracks are not straight. The round hole is the worst. Nothing but time and experience will permit the machine tender to do an expert job in sewing such places in a wire.



Mesh filled up with pitch.

To strip a fourdrinier of its various parts without damaging the parts requires skill, but even more skill is required to string a new wire and to assemble the fourdrinier parts without injuring the wire.

The machine tender should know where the edges of the wire should run on the couch, and the difference, if any, between the couch and breast roll.

Before starting up, the apron and the inside of the wire should be washed to avoid any possibility of wire injury from some object running around the breast roll or through the couch. Following these operations, the wire should be run ahead a short distance and the hose used to remove anything from the surface of the wire that may have been washed off the apron—again to prevent any possibility of wire spots.

After stock is on the wire, the surface of the carrier rolls should be checked for stock accumulations. If stock has accumulated on some of the rolls, it should be squirted off with a hose.

There is a wrong and a right way to squirt off rolls. It is wrong to start from the front side. In so doing the stock is driven by the stream further in on the roll surfaces where it will gather more thickly and thus wrinkle the wire. If running a double couch, precaution should be taken to be sure that no stock has gathered on the bottom roll on the start up. Stock may gather on any of the other rolls, and, if the wire is not too tight, it may do little or no harm to the wire. Stock on the bottom couch, however, will ruin a wire in a very short time.

If a coating of stock on a carrier roll is not too thick, it may be removed by applying a pressure hose to the back side. It is necessary to squirt off only a little at a time since all of the stock that is removed is finding its way to the breast roll. Any sizable chunks of stock removed in this way naturally will put slack places in the wire.

If the coating on one of the inside rolls is heavy, it is best to shut down and to wash off such stock as can be removed — repeating the operation, if necessary, after advancing the wire a couple of feet. If the attempt is made to wash off such stock while the machine is running, a number of slack places may be put in the wire and there also is the possibility of wrinkling it.

When shutting down a machine, the slices or apron should not be squirted off before the wire has stopped. If this precaution is not observed, there is the possibility of something getting on the wire and going through the couch or beneath the lump breaker, thus spoiling the wire. Likewise, in squirting up around the deckle frame, slices or straight edge, slime is apt to be washed off. If such slime is run through the couch, it may fill up the mesh of the wire or make spots in it. In either case, a shutdown may be required to clean the wire.

In making a wire change, every member of the machine crew has certain responsibilities. Immediately upon

(Concluded on page 607)

Fork Trucks *in the Paper Industry*

RAY E. MADDEN, Asst. Sales Manager
Clark Tructractor Div., Clark Equipment Company

▸▸▸ FAST LOADING AND UNLOADING of freight cars has contributed greatly to the efficiency of the railroads and has assisted them in meeting the ever-increasing demands of the war effort, according to Joseph B. Eastman, director Office of Defense Transportation. Because of the time element and manpower shortage the assistance rendered by fork truck methods of material handling to this program cannot be overestimated.

A survey of the manpower shortage in the pulp and paper industry has been undertaken by the American Paper and Pulp Association. This survey relates specifically to ways and means of using women for replacements and as to where they might be employed most satisfactorily.

In an article entitled "Women Can Operate Material Handling Equipment," published in the February, 1943, issue of *D & W*, Colonel John T. Harris, U. S. Quartermaster Corps, tells about the fine jobs that women are doing in operating fork trucks and industrial haulage equipment in all of the large army warehouse depots throughout the country. In the field of loading, unloading, and handling of heavy materials, women would have continued to be an unknown quantity if it had not been for power-operated materials handling equipment.

There are few industries where the flexibility of fork trucks can be used to more complete advantage than in the paper industry. The industry already has utilized such equipment for the handling of skids and pallets loaded with flat stock.

In the handling of paper on skids or pallets, the unit load varies from 4,000 to 6,000 lb. Such a load, after being wrapped with wrapping paper and covered with a rigid cover, is held together and bound to the pallet or skid with steel strapping or long bolts. These large units can be handled more easily and quickly with fork trucks than can boxes of paper (weighing from 500 to 800 lb. each), with hand trucks.

In one instance, shipping of a particular paper in unit loads of 4,000 lb. instead of in 600 lb. cases saved over 13 cubic feet of shipping space per ton. Besides this saving in shipping space, it also resulted in savings of 75 per cent in packing costs, 75 per cent in packing time, and over 90 per cent in loading and unloading, as well as an additional 20 to 30 per cent in plant handling operations.

Another paper mill saved over $100,000 in one year by shipping 30 per cent of its output on skids. A third mill found that the use of returnable pallets and skids paid a 100 per cent dividend in 10 months and resulted in savings of over 3 per cent of the selling price of the paper.

In still another case, a study was made of the cost of unloading a carload of pulp. The load consisted of 225 bales. Each bale weighed 500 lb. The pulp had to be moved from the car and stored at a distance of 200 ft.

Thirty-five bales were removed by hand labor using standard two-wheel stevedoring trucks. The remaining 190 bales were removed by one operator and a 3,500 lb. capacity fork truck with chisel type fingers.

The cost of unloading the 35 bales by hand labor at 30 cents per ton amounted to $2.63. The 190 bales were unloaded for a cost of $1.76, or 3.7 cents per ton.

LEFT—Large roll of paper in elevated position on fork of truck. RIGHT—Fork truck being used for handling bales of pulp.

LEFT—Fork truck being used to store paper. RIGHT—Loading paper into auto truck.

The operator of the fork truck covered by this study was a paper mill employee who had only four days of previous experience in unloading and storing and never before had he driven an industrial tractor of any kind. His average time per round trip (which included driving in the box car, lifting a five-bale unit load, tilting, backing out of car, traveling 200 ft. to storage, placing load on floor, pushing stock in place, and returning for another load) was 2.77 minutes.

Depending on the length of haul and other operating conditions, two fork trucks, each with an operator, can do the same amount of work as a ten-man crew in half the time and at a saving of 75 per cent.

Floor space in some paper mills is at a premium. Here again the fork truck has proved to be of value in lifting and tiering of materials, thus allowing utilization of all available storage areas.

Various types of material handling equipment have been found to be of assistance in paper manufacturing.

However, there are few, if any, of the specialized jobs which cannot be done by the fork truck alone. Twenty-four hours a day performance, economical operation, time saver, labor saver, and lower handling costs are primary features of this machine.

Care of the Wire

(Continued from page 605)

stopping the wire, all hands go to work. One member of the crew may cut the wire at the couch. Several men may be assigned to different places on the fourdrinier for the purpose of dismembering the several individual parts. Care must be exercised in all of this work, otherwise, trouble will show up later on.

For example: One member of the crew may be responsible for taking off the bottom apron which is secured by tacks. He may be careless and has that "don't care attitude." Feeling that the old wire is no good now, he seizes one end of the apron, yanks it off and lets the tacks fly where they may. Some of the tacks fly out on the old wire which is being run off on a pole. Possibly only one tack goes with the wire. It passes through the couch and sticks in the jacket. There it remains unobserved.

A new wire is put on. The machine is started.

Later, the machine tender notices a wet streak on the face of the jacket. Possibly he fails to heed this warning. After it is too late, he notices that the wire is ridged and shuts down the machine. Then, he learns that there is a tack in the jacket. Had he heeded the warning he would have observed a small streak of water getting by the guard-board — which meant that a tack was nicking the top surface of the wire. Knowing that this condition existed, the machine would have been shut down immediately and the tack removed before it had done any serious damage to the wire.

A few other causes of short wire life are:

Roll or rolls of foudrinier part out of balance

Sharp curves and too many of them in wire travel

Stalling or slipping of wire

Filler in paper

Slow stock causing wire drag

High atmospheric pressure on suction boxes

Lashing of slack wire

Incompletely washed chemical pulp

Use of white water on carrier rolls (Deposit of stock on rolls causes wire ridges)

Fourdinier rolls out of distance or out of caliper

Uneven covers on suction boxes

Bursting jackets

Chemicals used for souring wire

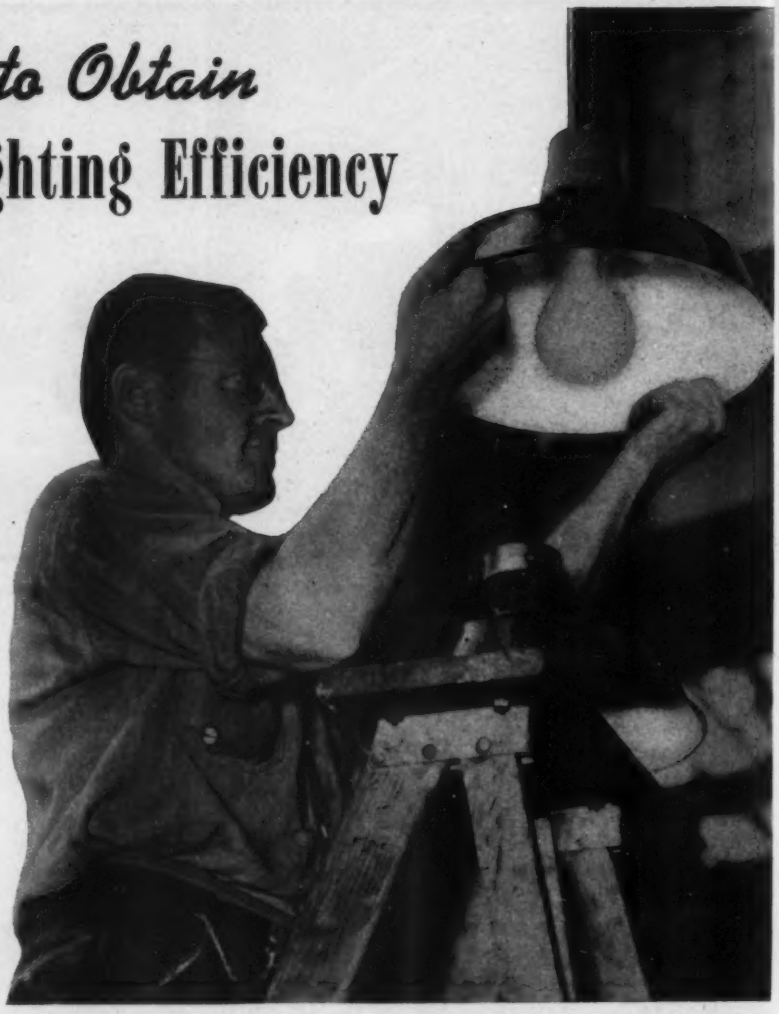
The fewer the return rolls on the fourdrinier part, the better. In fact, the less strain on the wire from any cause, the better it will be for the wire. Consequently, all roll bearings on a fourdrinier should be of the antifriction type. Likewise, since the wash roll must be chafed or contacted by a doctor, there should be some means of driving it other than by the wire. This roll has a habit of stopping in a break, and many a wire has been spoiled because of it.

Nonmetallic covered tube rolls give better wire life than metal rolls.

The faster that a machine runs or the heavier the paper being made, the greater the strain on the wire between the suction boxes and the couch roll. Sometimes the strain may part the wire or it may only break some warp threads —causing a crack.

To get the best possible life out of a wire, it is necessary for the machine tender to know his job, to be observant, to be careful, and thorough, and to work with whirlwind speed whenever the occasion demands.

How to Obtain Optimum Lighting Efficiency



Removable reflectors make it possible for the maintenance man to remove a dirty reflector and replace it with a clean one that is carried as an extra. He then washes the dirty reflector on the floor and repeats the procedure at the next luminaire replacing the dirty reflector with the one he has just washed. This saves him one trip up and down the ladder at each luminaire.

JOHN J. NEIDHART, Engineer, Lighting Division Westinghouse Elec. & Mfg. Co., (Cleveland, Ohio)

▸▸▸ MAXIMUM EFFICIENCY without sacrifice of quality has always been a goal and byword of American industry. In the past, peak efficiency has meant only greater profits and improved consumer goods at lower prices. Today, however, efficiency has taken on a new and much more important meaning, for the more quickly and efficiently our plants produce the vital material needed to supply our fighting forces, the sooner we will achieve our goal—*Victory*.

If we examine the different ways that productive efficiency may be increased, we soon learn that high levels of proper quality illumination enable workers to produce more goods with less effort. Although it is essential that the lighting installation be carefully designed to obtain the best results, we shall not discuss the design of the lighting system but shall instead see how we may obtain optimum operating efficiency of any lighting installation.

The efficiency of any given lighting installation is dependent upon two things; (1) the painting of all surrounding surfaces, which might absorb some of the light; and (2) the maintenance of the lighting equipment.

Painting

High reflection factor, matte or semi-matte surfaces, are essential for maximum utilization and diffusion of the light. Ceilings, walls, trusses, columns and machinery may absorb a considerable percentage of the light if their surfaces are not painted a light color; causing most of the light striking the surface to be reflected, increasing the amount of light reaching the working plane. Selection of the paint to be used should be governed by the following requisites:

Reflectivity—High reflection factors lead to high efficiencies, and it is, therefore, desirable to paint all ceilings, walls, trusses, and columns with a paint having a reflectivity of 75 per cent or better except for a darker wainscot below the working plane. Although it is not possible to maintain this high reflection factor for an extended period of time in factory areas having a dirty or oily atmosphere, the reflectivity will at all times be higher than if it had been low initially. The reflectivity always can be restored to its initial value by repainting or by washing.

Finish—Glossy finishes should be avoided, for the resulting specular reflections of the light sources will cause annoying glare. A matte finish is most desirable in clean areas since it will provide for greatest diffusion of the light and will completely eliminate specular reflections. A semi-matte or egg shell finish is usually more satisfactory, since it has a smoother surface which does not collect dirt as easily as does the relatively rough surface of a matte finish.

Durability—In every factory, the reflectivity of the paint eventually may be impaired by dust and dirt collection. It is, therefore, advisable to select a paint which is moisture resistant and levels out to a smooth continuous film which is resistant to soiling and may be washed frequently with soap and water. If the painted surfaces are exposed to vapors and gases, special fume and moisture-resisting paint should be employed.

Color—In general, all surfaces except the machinery should be painted white since white has a higher reflectivity than any color and helps create a bright, cheerful atmosphere. White

paints are often tinted slightly with blues or yellows, but tests have indicated that the natural or warm whites depreciate less with age than do the blued whites. Slightly blued whites, however, are often the most desirable when used with incandescent or 3,500 deg. white fluorescent lamps, since the blue tint of such paints will tend to be color-corrective and provide a more balanced, non-chromatic white light. The machinery may be painted a medium gray, but tests have shown that visibility and safety may be enhanced by painting the working area of the machine a lighter, contrasting color such as buff or cream.

Advantages of Proper Painting

High reflection factor surfaces will increase illumination and also provide for better diffusion of the light, minimize shadows, reduce harsh shadows between the light sources and the surroundings, improve seeing comfort and prevent the illumination from dropping off near the walls or around large columns.

A worker never should be forced to look up into dark surroundings when he raises his eyes from his work, for it will have a detrimental effect upon his eyes and lead to defective eyesight. When a person shifts his eyes from a bright area to a dark one, the eyes must readapt themselves to the different intensity. This is accomplished as: (1) the pupil becomes larger to admit more light, and (2) the retina becomes more sensitive to light. When the person looks back at his work, his eyes must go through this same procedure in reverse. Since a worker looks up rather frequently to rest his eyes by allowing them to focus on a more distant object, it is important that he looks up into light surroundings.

Scientific research has shown, for example, that 12 per cent less work is done when the eyes alternate between two brightnesses (one of which is 100 times greater than the other), than when the brightness is uniform. Furthermore, light surroundings create a more cheerful atmosphere and improve worker morale. Dark walls and surroundings, on the other hand, have the same effect as a dark gloomy day and tend to depress people who work within them.

Before and after checks on the illumination in various factories have proved that the illumination may be increased 100 per cent or more by proper painting alone. For example, an Ohio manufacturer found that the illumination in his factory was increased from five footcandles to fifteen footcandles by merely repainting all interior surfaces to prevent light absorption. Benefits resulting from such an increase in illumination become even more significant when one considers that it does not include the more intangible benefits of better diffusion and improved seeing comfort.

Maintenance

Maintenance departments of all factories should devote special attention to the care of lighting installations. Planned maintenance will assure peak efficiency and prolong the useful life of the lighting equipment. The best 50 footcandle installation is no better than a comparable 20 footcandle installation if burned out lamps are not replaced and the reflectors are not kept clean, reducing illumination to a fraction of its designed *maintained* value.

A well-planned maintenance program divides itself into two phases: (1) the *cleaning* of the lighting equipment and reflecting surfaces to remove dust and dirt, and (2) the *relamping* of the luminaires immediately after lamp burnouts or on a systematic lamp replacement plan.

Cleaning—The permissible time between cleanings is peculiar to each installation since the rate of decrease in light output varies with the type of lighting equipment and the amount of dust and dirt in the air. Dust tight covers will simplify the maintenance problem considerably in extremely dirty atmosphere such as are prevalent in foundries. The best method of establishing a cleaning schedule for any installation is to make periodic checks of the illumination with a light meter. The length of time required for the illumination to drop to approximately two-thirds of its initial value may be arbitrarily taken as a satisfactory cleaning period in most cases. This period may be as short as three or four weeks in extremely dirty locations, but it will usually be from two to six months under average conditions.

When luminaires are cleaned, all reflecting surfaces and glass covers should be thoroughly washed with soap and warm water. Merely wiping off the reflector or glass with a dry cloth is not only insufficient but is also apt to shorten the life of the reflector. Greasy dirt and grime which remains after several dry wipings will tend to form a permanent coating which cannot be removed.

Relamping—Rated life of a lamp is the average life of a large number of lamps and is not indicative of the life of any one lamp. Many lamps will have a much shorter life than the rated hours, but an equal number will burn longer than the rated hours. The lamps will, therefore, burn out at sporadic intervals with the maximum number of burnouts occurring at or near multiples of the rated life. Burned out lamps may either be replaced as burnouts occur or on a group replacement plan. The group replacement plan has the advantage that it may be combined with the cleaning program by arranging the cleaning schedule so that the lamps are approaching the end of life at some even multiple of the period between cleanings. At that particular cleaning, which may be somewhere between 80 per cent and 90 per cent of normal lamp life, the entire installation is relamped and the system is restored to practically its initial efficiency. The old blackened lamps which are close to the end of life may be discarded, but those showing signs of further useful life are set aside to replace the few early burnouts which will occur in the next group of lamps. Such a plan will materially reduce the labor cost of lamp replacement since there will be less wasted effort and setup time required when all the lamps are changed at once. Also, the additional labor required for relamping the luminaires as they are cleaned will be almost negligible.

Maintenance Methods—In low bay areas, lighting equipment can usually be maintained from step ladders, but higher bays present more of a problem. In some plants, the fixtures can be cleaned and relamped from a traveling crane, but it is frequently undesirable to tie the crane up for this work. Movable telescoping platform lifts are quite satisfactory in areas where the presence of machinery does not interfere with their use. One of the most convenient means of access to the luminaires is from catwalks, but the installation cost is high and they are feasible only on special applications where all of the fixtures may be mounted on a few catwalks. Automatic disconnecting hangers which permit the luminaires to be lowered to the floor by a chain or rope offer another convenient means of facilitating maintenance. A monorail system provides another quick and easy method of servicing the lighting equipment from traveling platforms or cars and is frequently used for large fluorescent installations.

Disconnecting type hangers or reflectors that are easily removable usually simplify the maintenance problem considerably, since the reflectors may be washed by one man on the floor or platform while a fellow worker removes the dirty reflectors from the luminaires and replaces them with clean ones. →

Results of Proper Maintenance

The importance of regular servicing of lighting equipment is strikingly illustrated by the results of tests conducted to determine the actual loss in illumination due to dirt collection on lamps and luminaires. In one case, a porcelain-enameled reflector for a fluorescent luminaire was removed from an average factory area and tested for light output in a photometric laboratory. Light output was checked during various stages of cleaning and results were as follows:

	Decrease in light output (per cent)
Dirty reflector and dirty lamps	22.8
Dirty reflector and clean lamps	18.1
Reflector wiped with dry cloth	6.2
Reflector and lamps washed	none

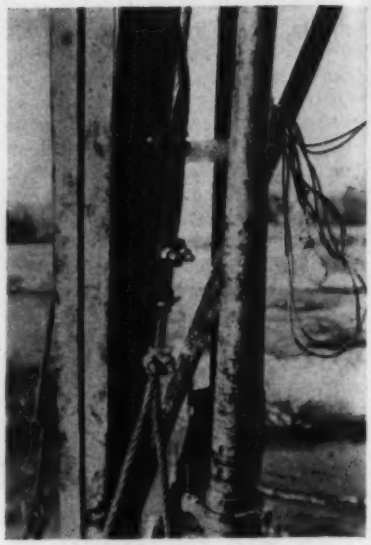
This reflector had not been serviced for approximately six months, if the period had been longer, the amount of light being wasted would have been even larger. Another laboratory test on two high bay reflectors yielded the following results.

	Decrease in light output (per cent)
A—Open High Bay Reflector from average factory area.	
(1) As found	42
(2) Dry wiped	35
(3) Washed clean	none
B—Enclosed dust tight high bay reflector from foundry.	
(1) As found	7
(2) Dry wiped	5
(3) Washed clean	none

The length of time since the last cleaning of both A and B above was over a year. The tests not only illustrate how much light may be wasted through neglect but also show two other interesting points. First, it is evident that dry wiping is entirely unsatisfactory for cleaning. The degree of ineffectiveness of dry wiping depends upon the character and oiliness of the dirt and the nature of the reflecting surface, but in no case is it adequate. Secondly, the comparison between A and B proves the economy of dust tight covers in extremely dirty locations, for B was in a much dirtier atmosphere than was A. In any case, whether the dirt be prevented from reaching the reflecting surfaces or whether these surfaces are kept at optimum efficiency by frequent washing, it is obvious that *it pays to keep lighting equipment clean.*

Putting Clips on Wire Rope

F. L. SPANGLER, M. E.



▶▶▶ THE CLIP FASTENING shown in the accompanying picture is materially weakened because of the way the clips have been applied to the wire rope. Unfortunately, it is no worse than hundreds of other clip fastenings made by rope handlers who are either careless or just don't know any better. And in these days when replacements of wire rope or other equipment are hard to get, and machine shutdowns are more costly than ever before in all history, clips are mighty important.

What's wrong with the applications?

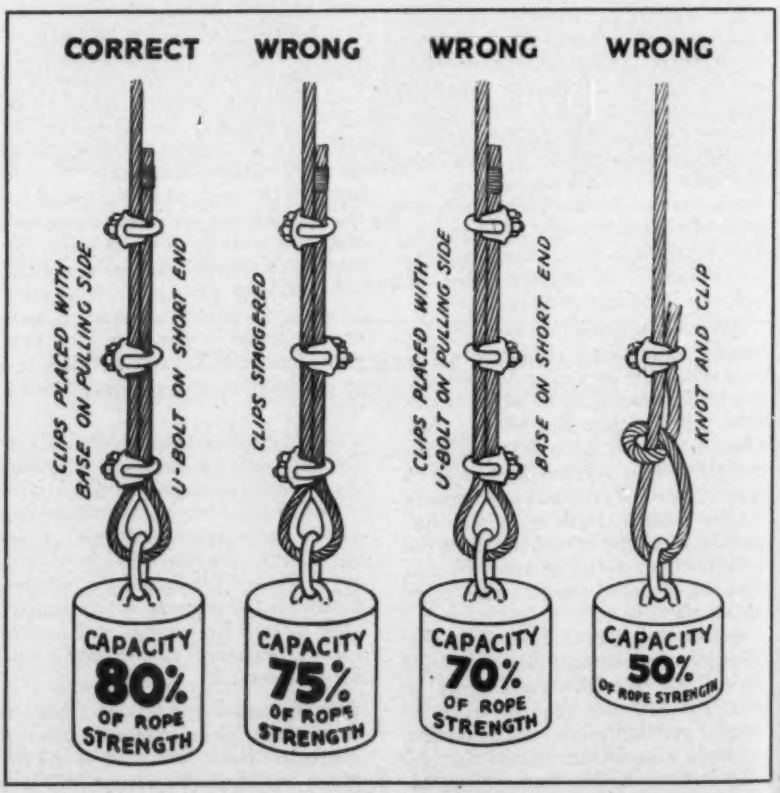
1) The clips are staggered instead of all being applied with the base, or saddle, against the pulling rope and the U-bolt against the short end.

2) The short end between the two top clips is slack and can't take any of the load; hence, the top clip is useless, and we have the equivalent of only a three-clip fastening.

3) The bolts on the top clip have obviously been drawn too tight, thereby misshaping and weakening the rope at this point, and still further reducing the efficiency of the fastening.

4) The two middle clips are too close together. Clips should be evenly spaced at about six times the rope diameter or more.

(Concluded on page 611)



Illustrating reduced efficiency of clip fastenings caused by incorrect application of clips or by bad design.

Cleaning House in a Paperboard Mill

WILLIAM DAHL, Superintendent
Clifton Paper Board Company

▸▸▸ CLEANING HOUSE is no easy task in a paperboard mill that runs 120 hours a week without stopping, but there are four important reasons why it is a job that has to be done. All of them are equally vital: (1) safety and health; (2) manpower morale; (3) prevention of breakdowns, and (4) reduction of vermin.

Our mill runs continuously from 7:00 A.M. on Monday until 7:00 A.M. on Saturday, but when the day shift takes over on Saturday, we shut everything down and clean house from top to bottom. If we didn't clean up at least once a week, our accident and absentee rates would jump, stoppages due to breakdowns would become more frequent, and we probably would be overrun with mice and rats. So we wash and scrub religiously every Saturady. Cleaning up is more than a practice with us; it's a ritual.

Dirt interferes with production, in more ways than one. We say around this mill that "production is done on clean-up day." A broken part is almost sure to be a dirty part.

Employees at this mill work three shifts, and since the shifts are altered every week, the job of cleaning up falls to one gang only on one Saturday out of three. Shifts change over week ends, so the crew that cleans up on Saturday does not go on again until 11:00 P.M. on Monday. Each crew cleans up its own machine or section, which centralizes the responsibility. A fixed procedure is followed in the cleaning, which is carried on under the author's personal supervision, and which is followed by rigid inspection.

The entire wet ends of the paperboard machines are washed down and scrubbed, and the heater room is given a thorough cleanup to remove metal from the beaters. The weekly accumulation of pins, clips, wire, rags, and other scraps is removed from the settling troughs. All slime is eradicated with soap and high pressure streams of water. The floor of the beater room, and also throughout the mill, is washed meticulously.

Scrubbing all floors, catwalks, and stairs is an important safety measure. Unless they are cleaned up regularly, the wetness and steam of the mill result in a slime which makes them extremely hazardous.

One of the first steps taken is to change felts. Not all of them are taken off each week, but a certain proportion of them are changed every Saturday. Those which are dirty are washed thoroughly with soap and hot water, while those which are too worn are replaced with new ones.

The dryers are scraped twice each month. The only part of a dryer section that gets really bad is the wet end.

Cleaning up the machinery gives workmen a chance to detect parts which need replacement or other attention. On Saturday, we always look for pumps that need packing, or for bearings that are wearing out. In one of our recent cleanups we discovered that the bearing on a stock pump needed some attention.

Rats and mice are traditional hangers-on in all paperboard mills, but this New Jersey plant has discovered that its rigid clean-up procedure helps to overcome a nuisance that might easily become a menace. Every day we find some bale of wastepaper housing a brood of rodents, and not all of them are discovered in time. Some are bound to get away.

Since our shifts are continuous, without a break, the men naturally eat lunch right on the job. Ordinarily, that would mean crumbs and scraps for our rodent guests to feed on, but we spoil the feast in two ways. First, we keep 50-gallon metal cans by each machine—painted red for the red machine, and green for the green machine—into which all lunch papers, scraps, and other remanants are deposited. We are more careful about this than the offices and homes whence the paper comes that we buy. None of this paper is taken to the beaters. We send the cans to the city dump to be emptied!

Of course, our second safeguard against rats and mice is cleaning up the floors. If anything edible does escape our vigilance, it is wiped up when we wash the mill. Besides removing the food, it also eliminates odors from droppings.

We also keep a close eye out for oily rags. A paper mill is no place for anything that might cause spontaneous combustion. It's hazardous enough to risk the chance of fire in the baled-up wastepaper that we buy, without contributing to the danger by leaving oily rags around. Clean-up day is a good preventative against fire hazards.

Men, as well as machines and structure, have a well-scrubbed look at this mill, for the Clifton Paper Board Company is proud of its tile-walled shower room, and also of the fact that every man on every production shift takes a hot or cold shower, depending on his preference, before leaving the mill. The showers are used by 140 men every day.

The washrooms, toilets, lavatories and shower cabinets are kept as spotless and shining as those in a home or a hotel. A janitor is in constant attendance, and there is no sparing of soap and hot water to keep the rooms up to a rigidly high standard. The floors are mopped frequently throughout the day, and a thorough cleanup is a daily procedure. Every workman also has a locker of his own, and these are inspected at regular intervals and kept bright and shining.

There is no doubt that a clean mill makes for clean-cut men and clean-cut operations. And under today's conditions, with so much competition for manpower, a clean place to work in is a factor in reducing employee turnover. No matter how you look at it, cleanliness pays dividends in the paperboard business.

◆

Putting Clips on Wire Rope

(Continued from page 610)

Clips should not be drawn up too tight against the rope, but neither should they be permitted to become loose. With the clips fastened, all nuts should again be tightened after the rope has been put under tension. Clips should be tightened with every rope inspection.

When inspecting clip fastenings, it is extremely important to examine the rope at the last clip farthest away from the loop or bight, as fatigue breaks often develop at this point due to the fact that rope vibration or whipping is dampened here. Fatigue damage is less pronounced with preformed wire rope, which may be explained by the reduced tendency of preformed rope to vibrate or "whip," this type of rope being more flexible and not so "springy" as non-preformed.

It is important to apply a sufficient number of clips, and the minimum number recommended for different sizes of rope is as follows:

Rope Diameter	Number of Clips	Spacing of Clips	Length of Wrench
½" to ⅝"	3	3"	12"
¾" to ⅞"	4	4½"	18"
1" to 1¼"	4	6"	24"
1⅜" to 1⅝"	4	7"	24"
1½" to larger	5–7	10"	24"

Cotton Stalks *for* Synthetic Lumber*

F. W. zur BURG

▶▶▶ DURING THE PAST TWO DECADES much scientific investigation has been directed toward the elimination and profitable utilization of the waste products of manufacture and agriculture. One of the outstanding developments has been an industry that utilizes agricultural waste products to produce synthetic lumber. Such materials as cornstalks (*1*), bagasse (*2*), wheat straw (*3*), wood (*4*), whole cotton plants (*5*) and etc., have entered into the manufacture of the different synthetic lumbers, and the different products have met with varied degrees of success.

An investigation was undertaken to determine the feasibility of utilizing cotton stalk as a basic material in the manufacture of synthetic lumber. The cotton stalk is not just an ordinary waste, but a highly undesirable refuse when left standing in the fields; for, during the winter months the dead plant acts as a home for the boll weevil then in its dormant stage.

The cotton stalk used in this investigation was gathered immediately after the cotton had been picked. This stalk was not freed from dirt or foreign plant matter since it was desired to utilize a raw material in the investigation which would approximate as nearly as possible the raw material that a manufacturing plant could expect to buy if it were buying cotton stalk. The stalks were allowed to air-dry for six months before being used. At the end of this period, the moisture content of the stalks was determined and found to be approximately twenty per cent on the moist basis.

Prior to forming a pulp, it was necessary to reduce the cotton stalk to a state resembling chips. For this operation, a hammer mill was found to produce a satisfactory material. The hammer mill used in this work was equipped with quarter-inch openings in the screens. The product of the hammer mill contained five different components: (1) wood-like chips; (2) bast fibers; (3) flakes of bark; (4) fragments of other plants; and (5) dirt.

A first attempt was made to produce a pulp by cooking these chips with caustic soda in a manner similar to the production of soda pulp. For this purpose, a small digester, similar in construction to the commercial units, was made from 8-inch steel pipe. The bottom was forged conically and equipped with a blow-off valve. The top was fitted with a blind flange and this flange could be removed for the purpose of charging the digester. The digester was equipped with ¾-inch steam lines and a steam gauge.

In a series of runs, weighed amounts of chips, caustic soda and water were charged to the digester. The different cooks were made under differing steam pressures, varying amounts of caustic and for varying periods of time. The amount of bone-dry fiber resulting from each cook was determined by discharging the cooked product from the bottom of the digester, washing the black liquor from the discharged product, drying and weigh-

Table I—The effect of time, caustic concentration and steam pressure on the yield of fibers resulting from the cooking of cotton stalk chips.

Run No.	Bone-dry weight of stalk (Grams)	Weight of NaOH used (Grams)	Time of cook (Hours)	Steam Pressure Lb/sq. in. (Gauge)	Bone-dry yield (Grams)	Yield (per cent)
A*	404	60.6	0.5	90	234	57.9
B*	323	48.5	0.75	90	180	55.7
C*	323	48.5	1.0	90	163	50.5
D*	323	48.5	1.25	90	175	54.2
E	404	60.6	2.0	90	200	49.5
F	323	48.5	3.0	90	149	46.1
G*	321	80.0	0.5	90	196	61.1
H*	321	80.0	1.0	90	168	52.3
I	321	80.0	1.5	90	147	45.7
J	321	80.0	2.0	90	155	48.3
K	321	80.0	3.0	90	141	43.9
L*	321	80.0	0.5	40	240	74.8
M*	321	80.0	1.0	40	199	62.0
N*	321	80.0	2.0	40	188	58.6
O	321	80.0	3.0	40	173	53.8

(*) The product of these runs contained wood-like particles which were insufficiently digested and these particles would not yield to the action of a laboratory beater.

(*) Abstract of a thesis submitted to the Department of Chemical Engineering of the Virginia Polytechnic Institute, Blacksburg, Va., in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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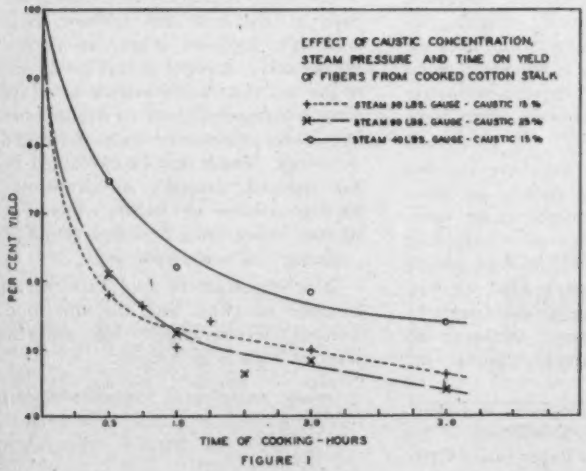

EFFECT OF CAUSTIC CONCENTRATION, STEAM PRESSURE AND TIME ON YIELD OF FIBERS FROM COOKED COTTON STALK
STEAM 90 LBS. GAUGE - CAUSTIC 15 %
STEAM 90 LBS. GAUGE - CAUSTIC 25 %
STEAM 40 LBS. GAUGE - CAUSTIC 15 %
PER CENT YIELD
TIME OF COOKING - HOURS

FIGURE 1

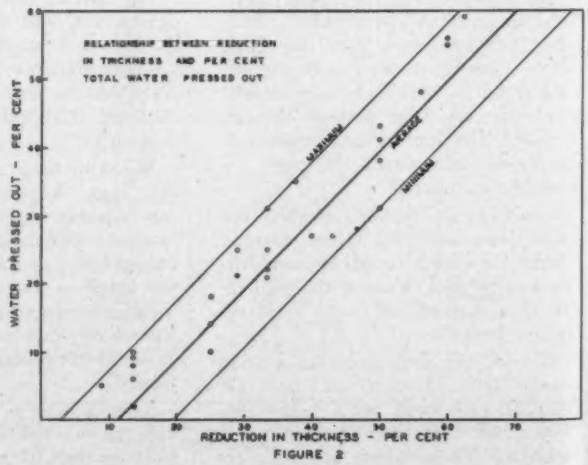

RELATIONSHIP BETWEEN REDUCTION IN THICKNESS AND PER CENT TOTAL WATER PRESSED OUT
MARINE
AVERAGE
DOUGLAS
WATER PRESSED OUT - PER CENT
REDUCTION IN THICKNESS - PER CENT

FIGURE 2

ing the dried fibers. The results of this series of cooking operations are given in Table I, and the data of this table are platted in Figure 1. It will be noticed that the points do not fit the uniform curve. This discrepancy is partially attributed to the fact that it was very difficult to obtain uniform samples, that is, samples which contained the same amount of the five components produced by the hammer mill. It is apparent that the increase in steam pressure has a greater effect on the digestion than the concentration of caustic from 15 to 25 per cent.

As indicated by the data in Table I, the best yield that can be expected when chips formed by the hammer mill are treated by the methods indicated will approximate 50 per cent. A pulp formed by this process also entails the problem of caustic recovery on the black liquor. With these two facts in mind, it was decided to attempt another method of forming a pulp from cotton stalks.

In certain studies (*1*) it has been shown that pulps could be formed from corn stalks by grinding the stalk in a rod mill. It has also been shown (*6*) that when cellulosic materials are mechanically worked in the presence of water, the cellulose undergoes a hydrolysis that results in the formation of a number of degradation products and that if the hydrolysis is stopped at the proper point, a mucilaginous substance is formed. This mucilaginous material might serve as a binder between the fibers.

With the above facts in mind, attempts were made to form pulps from the cotton stalk chips which were produced by the hammer mill. The rod mill used for this purpose was a Patterson eighteen-inch pebble mill. The total weight of the steel rods used amounted to 53.25 pounds and these rods varied in diameter between 1.25 inches and 0.5 inch.

In the first instance, an attempt was made to form a pulp by grinding one pound of chips with amounts of water varying between ten and fifteen pounds. Under these conditions the bast fibers were completely reduced within the first five to ten minutes of grinding and the wood-like particles were subjected to very little grinding action since they floated on the surface of the water and escaped the action of the rods. When the water chips ratio was reduced below six or seven pounds of water per pound of chips, the mass tended to pack and line the interior of the mill, and again little grinding action resulted. Therefore the ratio of one pound of air dried chips to six or seven pounds of water was used in subsequent experimentation.

Table II—Variation of Freeness with Time of Grinding.

Time (Minutes)	Freeness (Seconds)	Comments
0	------	
5	------	
10	------	Woody portions float.
15	100	No visible change in stalk. Brown color.
20	240	Few particles float. Much darker in color.
25	600	Well pulped. Black in color.
30	900	Little change in appearance.

(Note: In this grind, one pound of stalk was used with six pounds of water)

A freeness tester as described by Sweeney (*1*) was used to check on the progress of the pulping action of the mill. The results are tabulated in Table II.

Considering Table II, it appears that for a grinding time of fifteen minutes or less, the rods have not had sufficient opportunity to reduce the wood-like chips to a fibrous condition and with a grinding time of twenty-five minutes or more the freeness is too high to give a satisfactory pulp. At the end of approximately twenty minutes grinding, a definite change may be seen in the product. The color of the charge changes from brown to black and the mass becomes rather gelatinous. At this point and under these conditions, it is apparent that the gelatinous hydration product of cellulose commences to form in appreciable quantity.

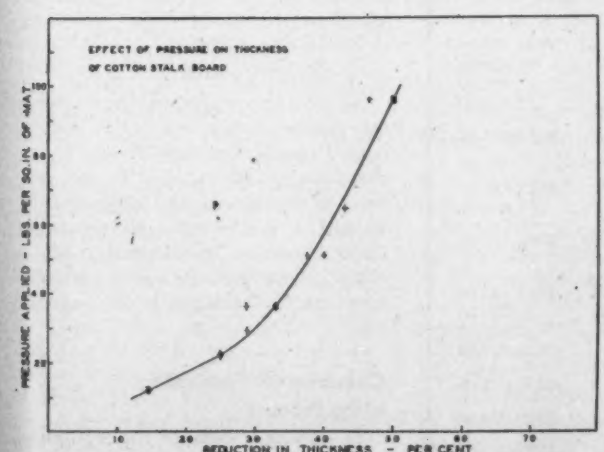
The stocks used to form the mats in the following series of experiments were made by grinding one pound of air dried chips with six or seven pounds of water for a period of twenty-five minutes. In each instance, the pulps from the rod mill were made up to 5 per cent consistency running this stock onto a stationary wire. The wet mats were pressed or rolled free of excessive moisture before being subjected to further treatment. The mat, formed by this method, was dried in a Proctor and Schwartz dryer. At the completion of the drying period, the mat possessed little strength since the fibers were not sufficiently in contact with each other. Atmospheric drying was highly unsatisfactory since the mat fermented and deteriorated beyond the point of usefulness.

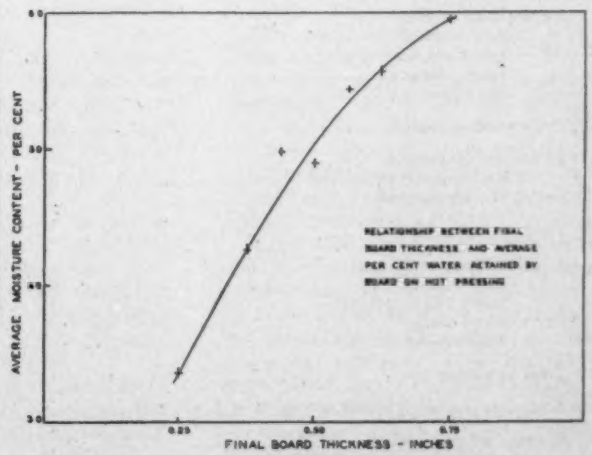
The best method of drying consisted in heating and pressing small mats measuring 5 in. by 5 in. between the hot platens of a hydraulic press.

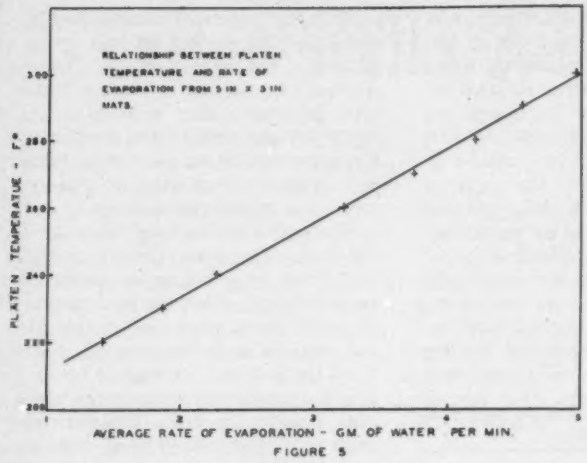
In studying the relationship between the decrease in thickness of the mats and the amount of water pressed out (as shown graphically in Figure 2), a linear relationship was obtained.

Figure 3 shows the relationship between the reduction in thickness and the pressure required to attain this reduction. As indicated in Figure 3, the amount of pressure required increases very rapidly with uniform increments of decreasing thickness.

While in the hot press, the surfaces of the mats were covered with 16-mesh screen in order to allow moisture to escape more freely from the surface


EFFECT OF PRESSURE ON THICKNESS OF COTTON STALK BOARD
PRESSURE APPLIED - LBS PER SQ.IN. OF MAT
REDUCTION IN THICKNESS - PER CENT
FIGURE 3


AVERAGE MOISTURE CONTENT - PER CENT
RELATIONSHIP BETWEEN FINAL BOARD THICKNESS AND AVERAGE PER CENT WATER RETAINED BY BOARD ON HOT PRESSING
FINAL BOARD THICKNESS - INCHES
FIGURE 4


RELATIONSHIP BETWEEN PLATEN TEMPERATURE AND RATE OF EVAPORATION FROM 5 IN. X 5 IN. MATS.
PLATEN TEMPERATURE - F°
AVERAGE RATE OF EVAPORATION - GM. OF WATER PER MIN.
FIGURE 5

of the mats. During the heating and drying of the mats, the press was opened at five minute intervals and the surfaces of the mats were examined. The mats were removed from the press when the surfaces had completely dried. This was determined by the ease with which the wire screen could be separated from the surface of the mat.

The thicker mats retained a relatively greater quantity of water than the thinner mats on hot pressing. A curve showing the relationship between the final pressed thickness of the mats as removed from the press and the average moisture content retained is given in Figure 4.

The rate of evaporation of water from the mats was a function of the platen temperature. A curve showing the rate of evaporation of water versus platen temperature is shown in Figure 5.

After the surfaces of the mats had been dried in the hot press, the mats still contained a high per cent of moisture. The mats were removed from the hot press, placed on a shelf covered with wire gauze and allowed to dry in the atmosphere. These mats were turned periodically to prevent warping. The moisture in the mats reached an equilibrium with the moisture of the air in about two weeks time. At the end of this time the final moisture content of the mats amounted to about 15 per cent of the weight of the mats on the wet basis.

Table III

1. Raw material costs:	
Cotton-stalk	$ 81,690.00
Raw water	2,160.00
Steam	12,150.00
Power	35,352.00
Total raw material costs	$131,352.00
2. Building and Equipment Costs:	
Manufacturing space	$ 13,020.00
Storage space	57,232.00
Land	2,000.00
Rail siding	5,000.00
Truck	1,200.00
Magnetic separator	1,000.00
Hammer mill	1,650.00
2 Rod mills	36,000.00
Forming machine and rolls	17,500.00
2 Hydraulic presses	190,000.00
Drying house and racks	161,000.00
Saws	4,470.00
Skid platforms	2,300.00
Boiler and equipment	13,590.00
Miscellaneous equipment	17,586.00
Total for building and equipment	$532,548.00
3. Labor and Supervision:	
As listed above	$ 57,200.00
4. Fixed Charges:	
Taxes	$ 13,089.00
Insurance	2,618.00
Social security	1,038.00
Depreciation	26,177.00
Total fixed charges	$ 42,922.00
5. Working capital:	
Raw material costs	$131,352.00
Labor and supervision	57,200.00
Fixed charges	42,922.00
Incidentals	2,500.00
Total working capital	$233,974.00
6. Capital Investment:	
Building and equipment	$523,548.00
Working capital	233,974.00
Total capital investment	$757,522.00
7. Annual operating cost:	
Raw materials	$131,352.00
Labor and supervision	57,200.00
Fixed charges	42,922.00
Maintenance at 5 per cent	26,177.00
Total operating cost	$257,651.00
Annual production (30,000,000 sq. ft. at $15/1000)	$450,000.00
Possible return (annual)	$192,000.00

The weight losses occurring on the board forming machine in the mechanical pulping process are relatively low when compared with the soda process. Drain water contained 0.440 per cent total solids divided between 0.126 per cent mineral solids and 0.314 per cent organic matter. The mineral content of washed stalk was determined as 6.6 per cent; considerable dirt contained on the surface of the original stalks is removed in the board forming operation. Eighteen pounds of water have been removed from each pound of pulped chips up to the air drying operation. Some of this water was lost on the forming machine and some in the press. For each pound of chips fed to the rod mill then the total loss amounts to 8 per cent or 0.079 pounds. There is also a weight loss of about 2 per cent in the hammer mill, but this is principally inorganic matter.

Tests on the product of the mechanical process indicate that the boards have a modulus of rupture which varies between 80 and 500 lb. per sq. in. On the average, the thinner boards showed a greater strength than the thicker boards. The thermal conductivity of the product varied between 0.291 and 0.708 B.t.u./hr./F.°/sq. ft./in.

Commercial Feasibility of the Process

In making a study of the feasibility of manufacturing a synthetic lumber

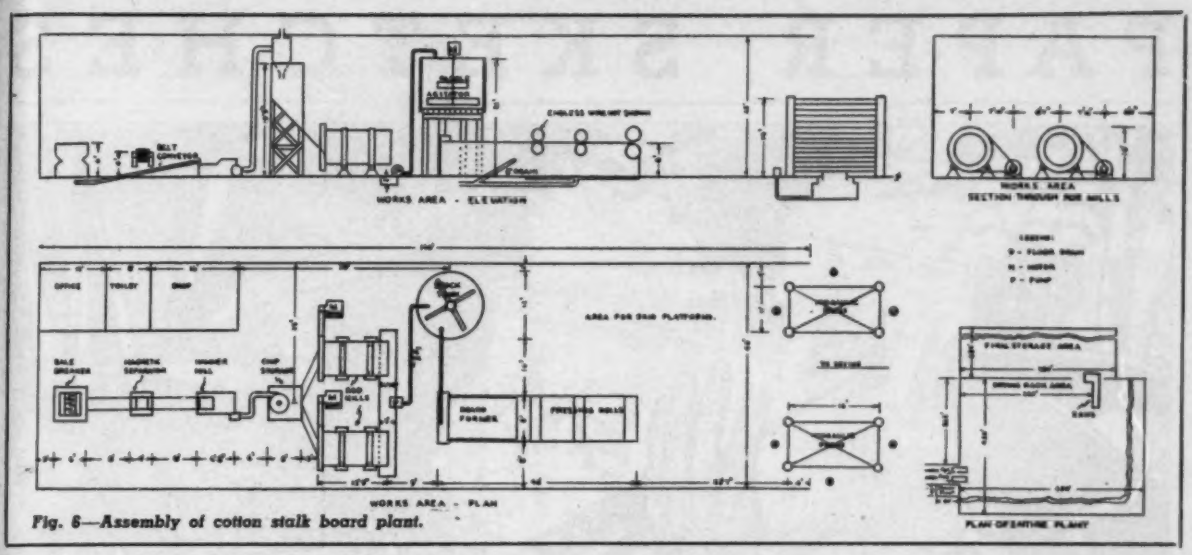


Fig. 6—Assembly of cotton stalk board plant.

from cotton stalk by the mechanical process, the methods indicated by Vilbrandt (7) were used. It was calculated that the total cost of mowing, baling, and bringing one ton of cotton stalk to the plant would approximate $5.85. Regardless of the fact that the farmer does himself a service by removing the stalk from his land in that he lowers the boll weevil hazard, it was decided to figure the cost of the stalk to the plant at $7.00 per ton in order to encourage the steady supply of stalk. The design calculations were based on an annual output of thirty million square feet of half-inch board per year.

In Figure 6, the plan and elevation of the proposed plant is given. It will be noted that the bales of cotton stalk enter the plant at the bale breaker. This machine has a capacity of 2,400 bales per day. The broken bales then pass to a hammer mill of the Gruendler "Wood-Hog" type, where the chips are formed through quarter-inch screens. Following this the chips are passed to two 6 ft. x 12 ft. rod mills for pulping. The stock from the rod mills is made up to a 5 per cent consistency and sent to a board forming machine of the "Ames" type. On this machine, water is removed both by suction and by pressing between rolls.

The wet mats from the forming machine are then sent to one of two hydraulic presses. The plates of these presses should be steam heated and should measure 100 in. x 200 in. Each press has twenty openings. On leaving the presses, the pressed board is allowed to air dry in racks for a period of two weeks and then sent to a set of saws. These saws are located between the drying house and the final storage house.

The manufacturing section of the building presented in this design is of brick construction while the drying house and the final storage section is of corrugated iron construction.

It was calculated that the following labor and supervision would be necessary to operate the plant: One general manager at $5,000 per annum; three technical men at $2,400 per annum; one clerk at $1,800 per annum; 44 common laborers at $3.00 per diem and two truck drivers at $6.00 per diem.

A preconstruction cost accounting on a 300 day/year basis was made on the process with the results shown in Table III.

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5) Bates, unpub. M.S. Thesis, Department Chemical Engineering, Virginia Polytechnic Institute, Blacksburg, Virginia

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How to Prevent Industrial Fires

▶▶▶ A PRIMARY REQUISITE for fire safety is "good housekeeping." Hence, clean up the premises. Rubbish makes convenient fuel for flames.

Second only to cleanliness is frequent inspection of fire extinguishers, sand and water pails, and hose connections and hose lines.

Employees should know what to do in case of fire. Even the simplest kind of organization is better than none. Doing the right thing first is perhaps the most important thing in case of fire. Employees should be drilled frequently.

Periodical inspections should be made of the definite fire hazards such as defective heating equipment, defective electric wiring and appliances, smoking in unsafe locations, improper use of gasoline and other flammable liquids.

Metal containers with covers should be provided for ashes, waste and combustible packing materials. Lockers (which should be of metal) should be examined frequently to see that workmen's clothing is not likely to be the source of spontaneous ignition.

Fire escapes should be clear of obstructions, maintained in good repair and fire exits should be adequately marked in conformity with the law.

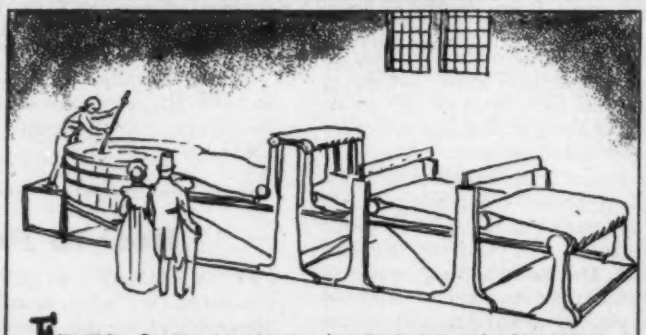
Fire doors designed to be kept closed should be kept closed. Other types of doors are designed to close automatically in case of fire. Keep these doorways unobstructed so that the doors can close when necessary. The basement should be effectively fire stopped with fire doors, etc., to prevent fire from spreading upward.

Make sure, by proper inspection, that the automatic sprinkler equipment is ready for service at all times. Sprinkler valves should be kept open.

Consult the Fire Department or fire prevention engineers about improvements which might be made in manufacturing or other business operations or processes.—*National Fire Protection Association (International).*

PAPER SKETCHES

DURING THE REVOLUTIONARY WAR THE WILLCOX MILL AT CHESTER CREEK, PENNSYLVANIA, PROMISED THE PENNSYLVANIA COUNCIL OF SAFETY, THAT A SELLER'S PAPER MOULD (IN THE MILL'S POSSESSION AND USED TO MAKE STATE PAPER) WOULD BE TOSSED INTO THE MILL STREAM SHOULD THE ENEMY APPROACH.



FELTS, SUCH AS WERE EMPLOYED IN THE PRODUCTION OF HANDMADE PAPER WERE SEWN END-TO-END FOR USE ON EARLY FOURDRINIERS.

BIBLE PAPER IS USED TO PRINT A SPECIAL EDITION OF THE WESTINGHOUSE MAGAZINE, EMPLOYEES PUBLICATION, FOR THE MORE THAN 900 WESTINGHOUSE EMPLOYEES SERVING OVERSEAS WITH THE ARMED FORCES.

TO INDUCE WOMEN TO SAVE RAGS, A PAPERMILL AT BENNINGTON, VERMONT, ABOUT 1790, URGED THEM TO COME TO THE MILL AND SEE HOW PAPER WAS MADE.

YOU'LL GET SERVICE A PLENTY FROM APPLETON FELTS, TOO!

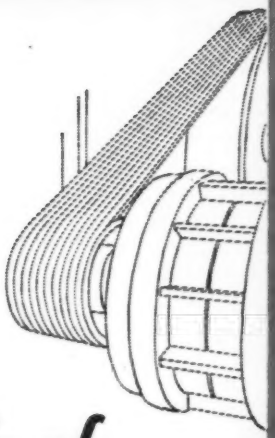
make APPLETON FELTS good paper

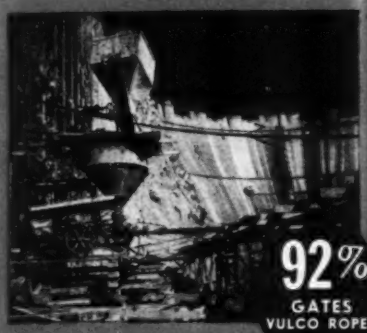
Service that paper mills expect from quality equipment, designed and manufactured with technical foresight to meet today's high speed production requirements of paper mills.

Appleton Felts are preferred by paper mills because since 1890 these felts have progressed with the industry, each year fully meeting the production requirements placed upon them—and today's standard for paper mill felts.

Appleton Woolen Mills

APPLETON • WISCONSIN



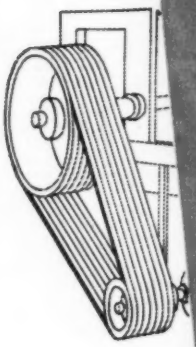


92% GATES VULCO ROPES

BOULDER DAM

Back in 1936 when Boulder Dam was still the biggest thing mankind had ever built, Gates Vulco Ropes were already first choice of America's leading Engineers. More than 92% of all V-belts used in building Boulder Dam were Gates Vulco Ropes.

Thousands of GATES VULCO ROPES



63% GATES VULCO ROPES

AMERICAN AVIATION INDUSTRY

In 8 of America's largest aircraft-producing units, 63% of all the belts now driving machines are Gates Vulco Ropes. Where belts are subjected to severe heat and oil conditions, Gates has supplied the aviation industry with thousands of special heat and oil resisting belts. These belts, made of a special synthetic rubber, withstand severe heat and oil conditions twice to three times as long as V-belts made with natural rubber.

87% GATES VULCO ROPES

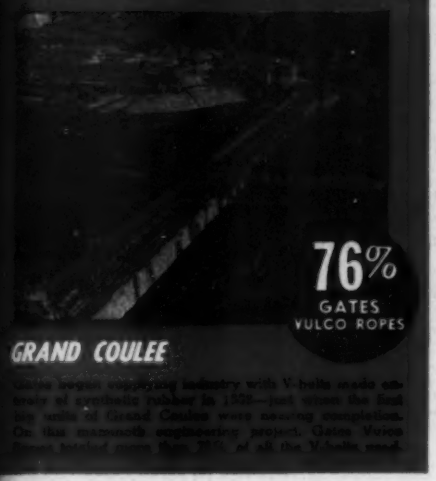
PENNSYLVANIA TURNPIKE

Built by 185 contractors from 18 different States—yet more than 87% of all the V-belts used were Gates Vulco Ropes.

94% GATES VULCO ROPES

GREAT CENTRAL VALLEY—California

In many ways the greatest project of all—and, here again, 94% of the V-belts selected were Gates Vulco Ropes.



GRAND COULEE

COLORADO RIVER AQUEDUCT

--in America's Greatest Industrial Projects—
Have Been Made Entirely of
Synthetic Rubber

It is no accident that GATES — the World's Largest Maker of V-belts—began supplying industry with thousands of V-belts made entirely of synthetic rubber *5 years before* anyone could know that supplies of natural rubber would be cut off by war.

The Gates synthetic rubber V-belt—now thoroughly tested by *years*, not *months*, of service—was in no sense developed as merely a "substitute" for rubber. It was designed to be—and in certain important applications it has *proved* itself to be—greatly *superior* to belts of natural rubber.

There is this to be kept always in mind concerning rubber:—A tree can make only one kind. In synthetic rubbers we have the choice of *many* kinds. Gates uses each kind where it best meets some particular service need.

In the Gates Special Heat and Oil Belt, for instance, a *very special kind* of synthetic rubber is used. This special synthetic rubber has the ability to withstand heat and oil much better than natural rubber can.

You know, of course, from every day experience, that your Standard Gates Vulco Ropes withstand exposure to heat and oil very well. It is when the heat or oil conditions become *excessively* severe that the Gates *special* synthetic V-belt, at a little higher price, has proved its ability to give *very much longer* wear than any other V-belt you can use.

Beyond any question, Gates has had *longer* experience and *more successful* experience in the fabrication of synthetic rubber V-belts than *any other* manufacturer.

To know of this will be to your advantage —particularly NOW when Gates' unequaled experience in making synthetic rubber V-belts can be put to use right in your own plant. You have only to look in your telephone directory and call the Gates Field Engineer. He will put at your service the full benefits of Gates' knowledge and experience *without the slightest obligation*.

THE GATES RUBBER COMPANY

439

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

CHICAGO, ILL. 549 West Washington
NEW YORK CITY 215-219 Fourth Avenue
ATLANTA, GA. 738 C. & S. National Bank Building
LOS ANGELES, CAL. 2240 East Washington Boulevard
DENVER, COLO. 999 South Broadway
DALLAS, TEXAS 2213 Griffin Street
PORTLAND, ORE. 333 N. W. 5th Avenue
SAN FRANCISCO, CAL. 1090 Bryant Street

ALLIED

H. K. FERGUSON CO. OPENS OFFICE IN BIRMINGHAM

A southern district office has been opened by The H. K. Ferguson Company, with head offices in Cleveland, Ohio. The new office is located at Birmingham, Alabama, and will be managed by C. W. Roberts, who has been associated with the Ferguson organization since the early 1930's.

The Ferguson Company has been handling some very important construction jobs, and has been awarded the Army-Navy "E" for excellence in construction at the Rocky Mountain Arsenal, Denver. Mr. Roberts was manager of that project.

The company is this year celebrating its twenty-fifth anniversary. In that quarter of a century, it has made a record for outstanding work in designing, building, and equipping factories and industrial plants.

◆

LINE OF DOPP KETTLES BOUGHT BY BUFFALO FDRY. & MACHINE CO.

Buffalo Foundry & Machine Company, Buffalo, New York, has purchased the manufacturing rights of the entire line of Dopp kettles, formerly built by the Sowers Manufacturing Company. The engineering, manufacturing, and sales personnel have been retained by Buffalo.

Dopp kettles, in their 40 years of active service to the process industries, have been extensively used for heating, cooling, and mixing. The various types include seamless jacketed and single shell kettles, mixers, soap crutchers, vacuum and pressure apparatus. Exclusive Dopp features are one-piece body construction and scraping agitators, designed to speed production through improved heat transfer.

◆

▶▶▶ A NEW BUILDING, located at 135 Cedar Street, New York City, has been purchased by the Metallizing Company of America as eastern headquarters for sales and service operations in that area. L. E. Kunkler, president, stated that due to the sharply increasing demand for metallizing equipment, this new move makes possible an amplified service to all users in the east. V. A. Cook will continue in charge of eastern operations.

◆

DOW COMPANY OPENS ADDITIONAL OFFICES IN EASTERN AREA

For the purpose of making available adequate personnel and contacts for the trade, Dow Chemical Company, of Midland, Michigan, has found it necessary to open additional offices in the eastern area.

The company has maintained offices in New York for several years, under the management of Ralph E. Dorland; however, Mr. Dorland is not desirous of taking over the heavy responsibilities of opening additional offices, and, although willing to remain as manager of the New York office, he has requested that an eastern sales manager be appointed.

Therefore, officials of Dow have appointed Clayton S. Shoemaker as eastern sales manager and Frederick A. Koch as assistant eastern sales manager. Mr. Shoemaker has been associated with the company for a number of years and has occupied various sales executive positions, while Mr. Koch has been assistant manager of the New York sales office for 15 years. Both of them will make their headquarters at 30 Rockefeller Plaza, New York City.

Mr. Shoemaker has announced the appointment of Alexander Leith, Jr., as manager of the Philadelphia office and Alfred A. Lawrence as manager of the Boston office, both of which will open in the near future.

Clayton S. Shoemaker

Frederick A. Koch

HARRIS-SEYBOLD-POTTER CO.'S NEW MID-YEAR CALENDAR

"God Bless America and Her Allies" is the theme of the painting by T. M. Cleland which appears on the new mid-year calendar of Harris-Seybold-Potter Company, Dayton, Ohio. (See page 580.)

The theme of the past two Harris calendars was "God Bless America," and this year Mr. Cleland broadened his portrayal to include the United Nations—the Statue of Liberty and the surrounding figures of the United Nations symbolizes the barrier beyond which the destructive forces must not trespass upon human liberty. The painting is lithographed in four colors.

◆

NEW PAINT CANS NOW MADE OF KRAFT PAPER

A new process employing kraft wrapping paper and non-critical materials in place of the tin-plated steel formerly used in the manufacture of paint containers has been perfected by engineers of the Sherwin-Williams Company, and is now saving tons of steel daily. An unused portion of the company's Chicago factory has been equipped with second-hand machines and "home-made" conveyor lines, and the new continuous can-winding process is now at work, converting rolls of ordinary wrapping paper into unbreakable leak-proof cans.

The cans are built up on the mandrel from layers of the paper strips which are automatically fed and glued into a sturdy tube. Automatic cutters chop yard-long lengths from the tube as it comes from the mandrel, and other cutters chop these lengths into can-high cylinders. Top rim and bot-

"GIVE THEM A HAND"!

You maintenance men, stand up and take a bow. The way you are meeting repair emergencies, improvising here, using the old "gray matter" there, is something to praise. In the very spirit of the famous old postal order that "the mail must go thru," you men seem to have resolved that "the mills must run come what will." Good work.

Black-Clawson, Shartle and Dilts can only regret their inability to always cooperate as they would like on new machinery, until war's demands have ceased. However, the limited service available to you is yours for the asking. Feel free therefore, to use us whenever and wherever we can be of help. Consider our engineering department and maintenance men as part of *your staff.*

THE BLACK-CLAWSON CO., HAMILTON, OHIO

DIVISIONS

Shartle Bros. Machine Co., Middletown, Ohio • Dilts Machine Works, Fulton, N. Y.

BLACK-CLAWSON-SHARTLE-DILTS

tom are automatically glued and crimped on, and after a rotary pneumatic test to detect defects, the cans are ready for filling.

The cans, now produced in quart and gallon sizes, are suitable for camouflage and blackout paints; tank, gun, and airplane finishes; as well as being highly satisfactory for Kemtone, the resinous emulsion base wall paint which the company recently developed for home and factory maintenance work.

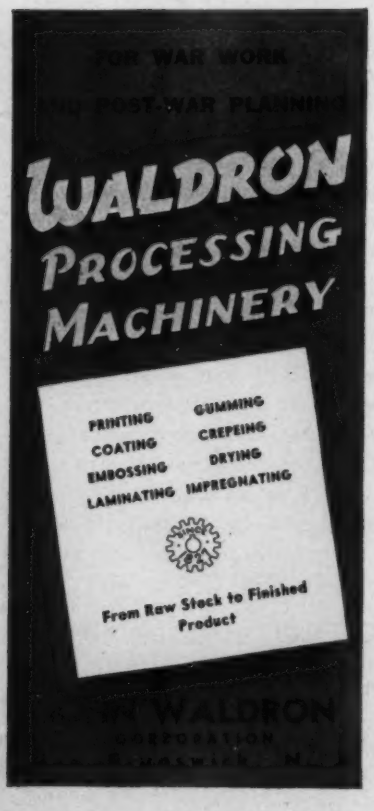
◆

HERCULES ESTABLISHES SALES RESEARCH DIV.

A new division—the Sales Research Division—has been established by Hercules Powder Company, Wilmington, Delaware, to investigate new markets for Hercules chemical products and to study the needs of industries served by the chemical company.

Dr. John H. Long will be in charge of the new division. Dr. Long is a graduate of Johns Hopkins University and has been with the company for 10 years, specializing on various technical problems involved in marketing Hercules products.

According to a statement by P. W. Meyeringh, vice president of the company, the new division has resulted from sales expansion in recent years into dozens of new industrial fields.



››› On the first anniversary of the presentation of the Army-Navy Production Awards, Under Secretary of War, Robert P. Patterson, and Under Secretary of the Navy, James Forrestal, made the announcement that 1,910 industrial plants and projects have been granted the Army-Navy "E" award for excellence in production of war materials.

During the past year, announcements have been published in this column of awards to paper companies whenever they have come to our attention. A large number of companies that have already received the "E" pennant are being awarded the white star for continued excellence.

"E" Pennant

H. K. Ferguson Company, Cleveland, Ohio—For excellence in construction at the Rocky Mountain Arsenal, Denver, Colorado, this company was awarded the coveted Army-Navy "E" pennant.

Fox Paper Company, Lockland, Ohio—Colorful ceremonies marked the recent presentation of the Army-Navy "E" award to the Lockland plant of this company. General Wm. H. Tunner, Commanding General, Ferrying Division, Air Transport Command, U. S. Army, presented the award which was accepted by Harold W. Nichols, president of the company.

Gates Rubber Company, Denver, Colorado—Col. Merle H. Davis, chief of the St. Louis Ordnance District, presented the Army-Navy "E" pennant for high achievement in war production to this company on August 29. Charles C. Gates, president, accepted the award on behalf of the company.

Link-Belt Company, Chicago—The Pershing Road plant of this company was awarded, on August 20, the Army-Navy "E," the third plant of this company to be thus honored. Brig. Gen. Donald Armstrong, Commanding General, Ordnance Replacement Training Center, Aberdeen, Maryland, made the presentation, and Edward J. Burnell, Link-Belt vice president, accepted the award.

Neenah Paper Company, Neenah, Wisconsin—This company was recently awarded the Army-Navy "E" for outstanding production on war contracts.

Niagara Alkali Company, Niagara Falls, New York—Presentation ceremonies of the Army-Navy "E" pennant were held at the Niagara Alkali plant on June 22. Col. Harry A. Kuhn, Chemical Warfare Service, presented the pennant, and S. Willard Jacobs, vice president of Niagara, received it on behalf of the employees and management of the company.

Taylor Instrument Companies, Rochester, New York—Col. John A. Rogers, Executive Officer, The Surgeon General's Office, U. S. Army, presented the Army-Navy "E" to this company recently. L. B. Swift, president of Taylor, accepted the flag and pledged the organization to ever greater effort in producing instruments for winning the War.

Warren Steam Pump Company, Inc., Warren, Massachusetts—Colorful ceremonies celebrated the award to the Warren employees of the "E" pennant for production excellence. The ceremonies were held September 7, at the company's plant.

White Star
(Continued Excellence)

Bauer Brothers Company, Springfield, Ohio.

Calco Chemical Division, American Cyanamid & Chemical Corporation, Bound Brook, New Jersey.

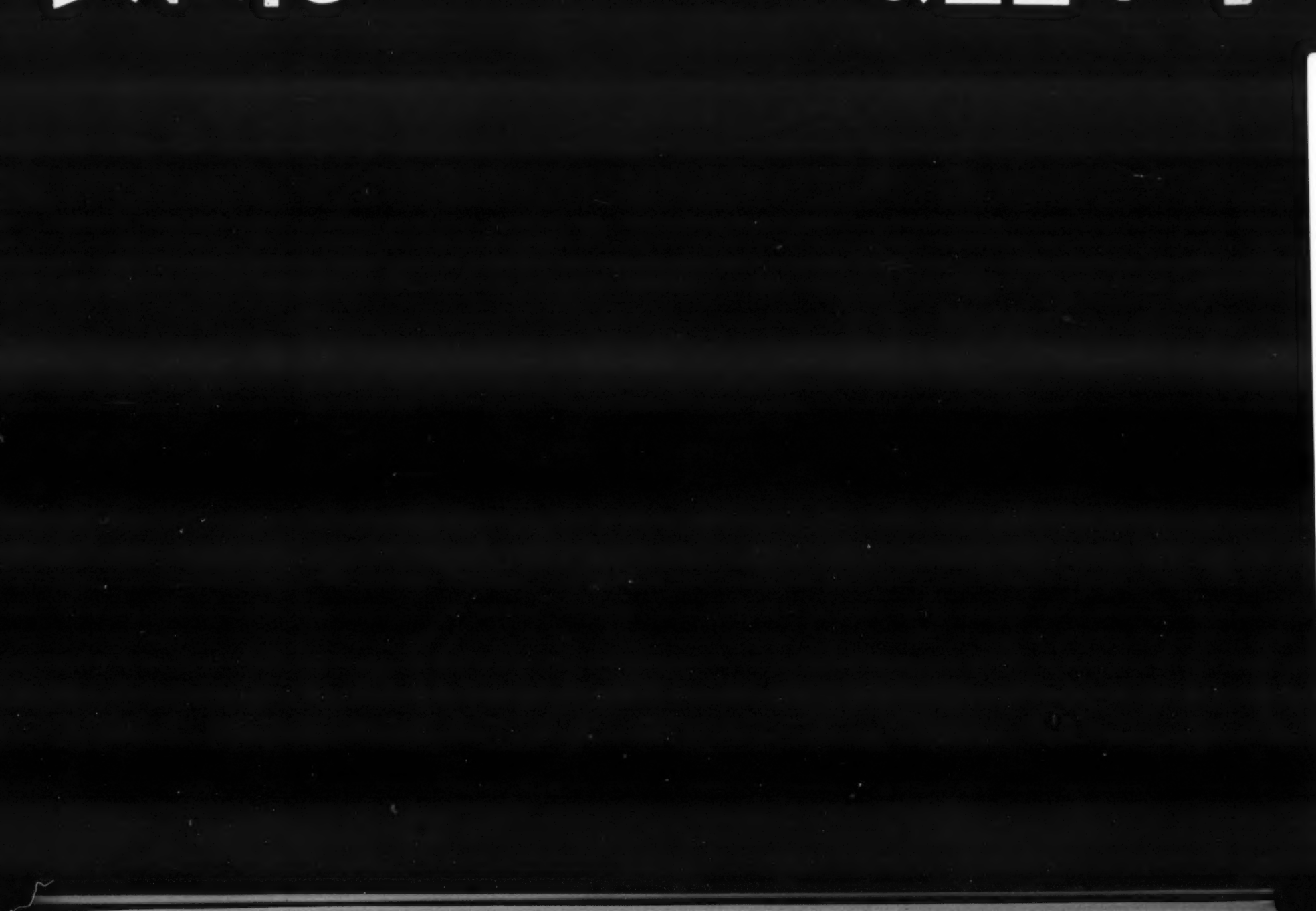
››› **Wm. Powell Company, Cincinnati, Ohio**—This company has already received the Army-Navy "E" award and has just been awarded the Maritime Commission's Award of Merit. It is said that there are not many companies in the country who have received both awards.

◆

S. O. CO. (IND.) ANNOUNCES A NEW LUBRICATING OIL

A new detergent type lubricating oil which will reduce wear and assure engine cleanliness and oil stability for low speed Diesel engines has been developed by Standard Oil Co. (Ind.).

Many engines give clean operation with conventional oils, but where dirty operation cannot be corrected by mechanical adjustment, the new detergent type lubricating oil can be used, according to Standard Oil engineers. The new oil will thus prevent ring-sticking, piston scuffing, and excessive sludge and gum deposits. The detergency results from the use of an additive which is both a detergent and an oxidation inhibitor.



When peace comes the lessons of destruction will be translated into machines for production with startling swiftness. What are your plans for the future? Even though you are busy with war orders today, are you planning to take full advantage of the latest scientific developments? Refinements in machine design invariably mean more Timken Bearings. True, a few Timken Bearings are better than none, but a fully Timken-equipped machine is both a better selling and better performing machine. Our engineering staff is available.

TIMKEN BEARING EQUIPPED

A symbol of quality for any piece of equipment with which it is associated.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

ASSOCIATIONS

TAPPI SCHEDULES FULL PROGRAM FOR WARTIME CONFERENCE

The program of the Army and Navy Requirements Conference, sponsored by the Technical Association of the Pulp and Paper Industry, to be held at the Palmer House, Chicago, Illinois, September 21-24, 1943, has been completed.

The entire morning of the first day will be devoted to the presentation of papers covering various packing and packaging problems of the Navy. The requirements of the Army will be covered in the afternoon session of the first day.

The Navy session has been arranged by Lt. (j.g.) Winfield Scott Hasslers; the Army session by Major Malcolm J. Odell, ASF.

Important group meetings scheduled for the second day (September 22) include an ordnance packaging session, a coating round table, an acid pulping round table, an Army-Navy and WPB session, a papermaking round table, an alkaline pulping round table, and a general session. In addition, during the morning and afternoon, groups not exceeding 50 will be privileged to inspect operations in the printing plants of R. R. Donnelley & Sons and W. F. Hall Printing Company.

A number of important papers are scheduled for a general session on the morning of the third day (September 23); and the entire afternoon of the same day will be given over to a water vapor permeability testing session.

Important speakers from outside the industry have been obtained for luncheon addresses, one luncheon to be held on the second day, and one on the third day of the conference.

During the entire conference, the Army and Navy will exhibit important paper products used for war purposes. About 10,000 square feet of the Palmer House exhibition hall will be given over to this exhibition and to a specially constructed theater, seating 150, in which will be shown significant motion pictures to illustrate various phases of the war and the part being played by paper and packages.

In arranging for this Wartime Conference, TAPPI has received splendid co-operation from various paper trade organizations, including Fine Paper Association of Chicago, Inc., Chicago Paper Association, Fibre Box Association of America, National Paperboard Association, Paper and Twine Club, Salesmen's Association of the Paper Industry, Set-up Paper Box Association of Chicago, Waterproof Paper Group, and the Waxed Paper Institute, Inc., as well as from mill supply dealers, chemical raw materials manufacturers, machinery manufacturers, paper manufacturers, and related firms.

◆

JAMES L. RITCHIE RETURNS TO THE APPA

James L. Ritchie, formerly a member of the staff of the American Paper and Pulp Association, returned to the Association on September 1, as assistant secretary, to assist E. W. Tinker, executive secretary of the Association. Mr. Ritchie went to the War Production Board in its early days, and was so successful in carrying out his duties that he was made chief of the Distribution Section in the Pulp and Paper Division. Because of his knowledge of the industry, he was able to serve the paper industry, as well as carry out the policies of the WPB, in such a manner that he earned the respect and good will of both Government and industry representatives.

◆

NEW ASSOCIATION WILL WORK TO CONSERVE FORESTS OF ONTARIO

The Ontario Forest Industries Association has recently been formed aiming "by close co-operation with the government and by active measures to maintain and conserve the forests of Ontario." Honorable W. Earl Rowe, president of Great Lakes Paper Company, Toronto, was named president, and Wallace A. Delahey, of Toronto, former assistant to the Federal Timber Controller, was elected manager of the new organization.

◆

N.I.A.A. REPORTS INTEREST IN WPB CUTTING TOOL DRIVE

WPB Cutting Tool Conservation Campaign reports by the National Industrial Advertisers' Association indicate an active interest in the campaign by members many of whom have pledged their co-operation. Several industrial campaigns have already been integrated with the over-all drive, and releases are expected early this fall. The campaign, being conducted by the WPB in conjunction with NIAA and the War Advertising Council, was developed by the WPB Division of Information and is aimed at current critical waste of industrial cutting tools. The campaign slogan is "Tools Are Weapons—Treat 'Em Right!" and members of the association are requested to include it in their advertising and promotional activities.

◆

NEW A.S.T.M. TESTS FOR PROPERTIES OF PAPER

Since its organization a few years ago, Committee D-6 of the American Society for Testing Materials, on Paper and Paper Products has been concentrating its work on satisfactory methods of testing and has been cooperating closely with the Technical Association of the Pulp and Paper Industry. At the annual meeting of the Society in Pittsburgh, seven new test methods were approved. The following list with short statements of scope indicate the applicability of these particular tentative standards.

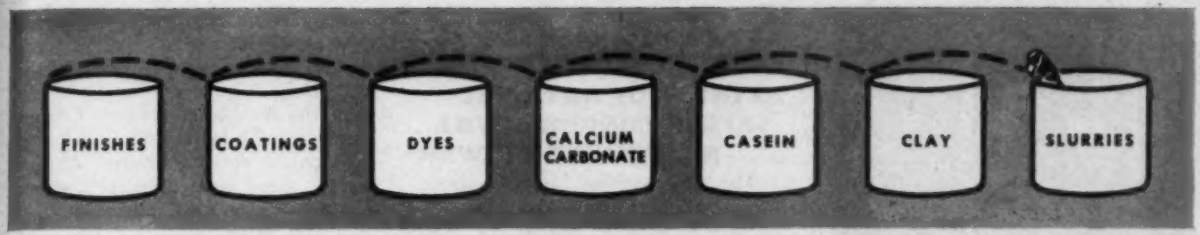
New A.S.T.M. Test Procedures:

Degree of Staining of Paper by Alkali—applicable to undyed papers. It can be used with hard-sized (rosin) papers by first removing the major part of the sizing with ether or methanol. It is not recommended for use with pulp.

Turpentine Test for Grease Resistance of Paper—gives an accelerated comparison of the relative rates at which ordinary oils or greases, such as commonly found in foodstuffs, may be expected to penetrate papers, such as uncoated or unimpregnated greaseproof, glassine, and vegetable parchment.

Wire and Felt Sides of Paper—four procedures for determining the wire and felt sides of paper. It is not always possible to make the distinction, this being particularly true of coated and other surface-treated papers, and of specialties made with variations in the usual paper-machine practice. When one of the procedures described in this method does not give a definite differentiation, it is advisable to try one or more of the other procedures. It is desirable to have means of distinguishing between the two sides, because they generally differ in some physical characteristics.

Surface Wettability of Paper (Angle-of-Contact Method)—intended for the quantitative determination of the resistance of paper surfaces to wetting. It is useful for the determination of writing and ruling qualities of papers, as well as for other problems related to the resistance which the surface of paper offers to water and aqueous vehicles. This method deals with the behavior of a drop of water, or liquid solution, when applied directly to the surface.



Carry them from job to job

OR MOUNT ON SINGLE TANK FOR 24 HOUR PRODUCTION LINE

Whether your mixing requirements call for a permanent installation or a utility unit that can be used for odd mixing jobs, "LIGHTNIN" Portable Mixers, are faster and more economical.

Portable, easily moved from one container to another, and readily adjustable to any desired angle, geared and direct drive "LIGHTNIN" Portables range in size from 1/8 to 5 H. P. to meet countless operating conditions.

"LIGHTNIN" Mixers are available with either electric or air driven motors. *For complete details, write for Bulletins B-75 and B-69.*

MIXING EQUIPMENT COMPANY, INC.

1035 GARSON AVE., ROCHESTER 9, N. Y.

Kerosine Number of Roofing and Flooring Felt by the Vacuum Method—the "kerosine number" of roofing and flooring felt is calculated from the maximum weight of a kerosine oil, of known specific gravity, retained by the felt after displacement of all the air from the interior voids. It is a measure of the amount of saturant which a given felt will absorb.

Resistance of Paper to Passage of Air—applicable to papers and paper products which permit the passage of 100 cu. cm. of air in 2 sec. to 30 min., except those which cannot be clamped securely against surface leakage, such as crepe and corrugated papers.

Flammability of Treated Paper and Paperboard—applicable to papers and paperboards of all types that have been treated to prevent the spread of flame when ignited. Such papers are commonly designated as "flameproofed."

A number of other test procedures are being considered in the committee, including the following: (1) Fiber composition, (2) ply adhesion, (3) wax pick test for surface strength, (4) stretch of paper and paperboard, (5) tensile breaking strength, (6) wet tensile strength, (7) erasing properties, edge tear, (8) curl, (9) stiffness, (10) hydrogen ion concentration (unbuffered and neutral papers), (11) gloss, and (12) water absorption.

Several other methods are being completed which are now receiving study. In this group are the following proposed tests: (1) Time of penetration by water of sized paper and paper products, (2) measuring bursting strength, (3) hydrogen ion concentration of paper extracts, (4) determining the effect of heating on folding endurance, (5) castor oil method for measuring printing oil penetration, and (6) water vapor permeability.

CONVENTIONS AND COMING EVENTS

Sept. 17-18—Joint meeting of the Northeastern Division of the American Pulp and Paper Mill Superintendents Association and the Maine-New Hampshire Section of the Technical Association of the Pulp and Paper Industry, Poland Spring House, Poland Spring, Maine.

Sept. 21-24—Technical Association of the Pulp and Paper Industry, Fall Meeting, Palmer House, Chicago.

Oct. 5-7—32nd National Safety Congress and Exposition, Hotel Sherman, Chicago.

Oct. 9—Joint meeting of the Pennsylvania-New Jersey-Delaware Division of the American Pulp and Paper Mill Superintendents Ass'n and the Delaware Valley Section of Technical Association of the Pulp and Paper Industry, Warwick Hotel, Philadelphia.

Oct. 27-28—Joint meeting of Southern and Southeastern Divisions of the American Pulp and Paper Mill Superintendents Association, Atlanta Biltmore Hotel, Atlanta, Georgia.

Nov. 4-5—Annual Conference of Packaging Institute, Inc., Hotel New Yorker, New York City.

Dec. 6-11—19th Exposition of Chemical Industries, Madison Square Garden, New York City.

● Developed specially by Armstrong for paper dryer roll service, these traps have extra air elimination capacity in addition to their regular function of removing condensate without steam loss. Results are higher production and lower costs, through faster heating, better quality paper and fuel savings. Users say there is nothing like this trap for dryer roll service.

Other production aids for paper industries: Armstrong compound traps for digesters, evaporators, etc. . . . forged steel traps for high pressure power plant service . . . and regular traps for heaters, cooking tanks, space heating coils, unit heaters and other equipment.

INVALUABLE FOR YOUR FILES—write for copy of Armstrong Trap Book, illustrating construction, operation and application details.

ARMSTRONG MACHINE WORKS
816 Hoffman St., Three Rivers, Mich.

ARMSTRONG
STEAM TRAPS • DRYER DRAINAGE SYSTEMS • MOISTURE CONTROL SYSTEMS • HUMIDIFIERS

SAFETY

KEYNOTE OF NATIONAL SAFETY CONGRESS WILL BE WINNING OF WAR

The 32nd National Safety Congress, which will meet in Chicago October 5, 6, and 7, will be one of the most important gatherings in the history of the accident prevention movement.

The keynote of the Congress last year was "Save Manpower for Warpower," and during the year that theme has become nationwide. The program this year is devoted exclusively to accident problems which have a direct bearing on the prosecution of the War and Victory.

Each of the 26 Sections of the National Safety Council has planned a special program with outstanding features; there will be more than 500 program participants in the 200 Congress sessions. The list of exhibits for the exposition already exceeds 150. Every session, every exhibit, every speech will be tuned to Victory.

The meetings of the Paper and Pulp Section will be held at the LaSalle Hotel Tuesday afternoon (October 5), Wednesday afternoon and Thursday afternoon. The keynote speaker at the opening session on Tuesday afternoon will be George J. Pecaro, plant manager, The Flintkote Company, Meridian, Mississippi. Mr. Pecaro will speak on the subject "Discharging Management's Responsibility for Safety." The same schedule previously used will apply to the Wednesday afternoon meetings: Two sessions will be held; one for Pulpwood Loggers, another for Paper Products.

One highlight will be missing from all of the Sections this year. Due to wartime conditions, no luncheon meetings have been scheduled. Therefore, there will not be the usual Luncheon Meeting of the Paper and Pulp Section, at which time the contest trophies have been awarded. The trophy awards will be made at the Thursday afternoon session. Following the presentation of awards, a panel discussion will be held on the subject "What Is Your Problem?"

The Sherman, LaSalle and Morrison hotels are the convention hotels. The Paper and Pulp Section will hold its meetings in the LaSalle Hotel. All three hotels will have registration desks.

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▶▶▶ THE LOWEST ACCIDENT FREQUENCY in logging operations for any of the pulp and paper companies in Quebec during the past three years is the record of the Quebec North Shore Paper Company, Baie Comeau, Quebec. The safety record of the woods camps is equaled by that of the mill itself, where, during 1942, the men won the National Safety Council award for the safest mill in its category on the entire continent. During 1942, they went through eleven months without a major accident. The mill also heads the list of safe companies of the Quebec Pulp and Paper Association Safety League.

◆

1943 EDITION OF ACCIDENT FACTS

Each year the National Safety Council issues a statistical yearbook called *Accident Facts*. The 1943 edition of this publication is an unusual one, due to the fact that the accident figures given are geared to the war production effort in the Nation's drive to conserve manpower which is vital to Victory.

Out of 286 cases reporting in the paper and pulp industry, the industry ranked 25 in frequency, having a frequency rate for 1942 of 21.52. The severity rank was 24 with a rate of 1.74.

Accident Facts is indeed a helpful source of safety information and it will prove valuable as a reference work. The statistics and other information are augmented by a large number of graphs and sketches, mostly in color.

◆

▶▶▶ NEWLY-ELECTED CHAIRMAN of the safety committee at Hammermill Paper Company, Erie, Pennsylvania, is *Ben Krebs, Sr.*, an operating assistant in the paper mill and one of Hammermill's longest-time employees. Vice chairman of the committee is *Eric Naschold*, assistant superintendent of the paper plant's maintenance department.

◆

1944 SAFETY CALENDAR

The Safety Calendar for 1944 is now available. This fine calendar is put out each year by the National Safety Council, Chicago, and besides being a convenient date reminder it serves as an integral part in the accident prevention program of many of the mills.

The theme of the 1944 calendar is "Safety—Yesterday and Today." Reproductions of fine paintings adorn the front of each of the pages, and the reverse side of each page presents a completely different treatment of safety material. The calendars may be purchased in quantities with the company name imprinted. Inquiries should be addressed to the National Safety Council, 20 North Wacker Drive, Chicago 6, Illinois.

How to conquer wood-destroying fungi

To fungi and bacteria, your lap and pulp stock supply is a source of food and nourishment. It furnishes an excellent feast—especially when aided by moisture and temperature conditions.

You can defeat this combination of destructive agents with Dowicides. These industrial germicides and fungicides pre-

vent mold growth in lap and pulp stock. Treatment is made by applying solutions of Dowicides; tests show that proper applications even control mold throughout the layers of stock.

During shut-down periods, souring of stock caused by bacterial action can also be prevented by the addition of Dowicides. This and other uses of Dowicide products are described in special literature available on request.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • St. Louis • Chicago • Houston • San Francisco • Los Angeles • Seattle

OTHER PROTECTIVE SERVICES—For the protection of pulp logs in storage, Dowicide G or P. For longer felt life—Dowicide G. For the preparation of mold-resistant paper products—Dowicide A, B and G. For the prevention of decay and termite attack—Dowicide G. For controlling slime conditions—various combinations of Dowicide with other materials. For reducing maintenance costs—Dowicide 7, preserves structural timbers; Dowicide 6, protects paint film from mold growths.

DOWICIDE

GERMICIDES AND FUNGICIDES

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

NAMES *in the* NEWS

Personals

NEW CONNECTION FOR HERMAN L. JOACHIM

Herman L. Joachim, formerly located at Los Angeles, California, is now vice president and general manager of the paper mill of A & P Corrugated Box Corporation, Boston, Massachusetts. This company has recently taken over the paper mill located at Mechanic Falls, Maine, where Mr. Joachim will be in charge of reconstruction work.

Mr. Joachim was formerly connected with the Container Corporation of America at Philadelphia, Pennsylvania, and removed to the West Coast in 1932, where he since handled several large paper mill expansion programs and designed and built fiber plants for the Defense Plant Corporation.

◆

NEW OFFICERS ELECTED— MARINETTE PAPER CO.

The board of directors of the Marinette Paper Company met in Chester, Pennsylvania, on August 19, at which meeting Darcy B. Wilkinson was elected vice president and a director of the company. Mr. Wilkinson recently was appointed general manager of the Marinette Paper Company, located at Marinette, Wisconsin.

At the same board meeting Henry W. Fales, manager of the company's plant at Glens Falls, New York, and F. O. Boylan, a member of the staff of engineering development at Chester, Pennsylvania, were elected to the board of directors.

◆

LESTER CHIRGWIN MADE A DIRECTOR OF THE FARREL-BIRMINGHAM CO.

Lester D. Chirgwin, general manager of the Buffalo plant of Farrel-Birmingham Company, Inc., of Ansonia, Connecticut, was elected a director of the company at a recent meeting of the Board.

Mr. Chirgwin first became connected with the company in April, 1909, when he was employed as an office boy. He entered Yale University in 1911, graduating in 1914 with a degree of mechanical engineer. While attending college, he spent his vacations working in the company's machine shop at Ansonia, and upon graduation re-entered its employ as draftman.

In 1918, Mr. Chirgwin joined the Emergency Fleet Corporation of the United States Shipping Board as an expediter for the western half of the United States; however, he left the shipping board in 1919, and again returned to the employ of Farrel-Birmingham.

◆

FREDERIC G. COBURN ELECTED PRESIDENT OF BROWN COMPANY

Frederic G. Coburn, of New York City, has been elected president of the Brown Company, Berlin, New Hampshire. Mr. Coburn, the first president of the company since its reorganization late in 1941, has been associated with the Brown Company for the past eight months, as special assistant to H. P. Kendall, who, as chairman of the board, served as chief executive pending the election of a president.

Mr. Coburn brings to Brown Company both technical and industrial training and experience in many different fields. A graduate of the United States Naval Academy and Massachusetts Institute of Technology, he was for many years an officer in the Construction Corps of the United States Navy. During World War I he designed, constructed, and managed the Naval Aircraft Factory, the Navy's only owned aircraft plant. His subsequent experience includes an executive position with Bethlehem Shipbuilding Corporation, Ltd., and eighteen years with Sanderson & Porter, engineers, in which firm he became a partner. He has also been connected with The Aviation Corporation and its subsidiary, American Airways, Inc., now American Airlines, Inc., and for several years he was engaged as president in the reorganization of McLellan Stores Company, and later was president of Air Associates, Inc.

Frederic G. Coburn

Other officers were re-elected as follows: E. H. Maling, vice president in charge of finance and accounts, and treasurer; W. L. Campbell, vice president in charge of manufacturing; H. E. Houghton, vice president in charge of sales; R. W. Bowlen, assistant treasurer and assistant secretary; R. H. Marshall, comptroller; J. B. Hopkins, secretary, and L. A. Pierce, clerk. All present members of the Board of Directors were re-elected, and Mr. Coburn was added.

◆

STULL AND McKINNEY IN HIGHER POSITIONS AT PAPER MAKERS CHEM.

Philip B. Stull, general manager of the Paper Makers Chemical Department of Hercules Powder Company, Wilmington, Delaware, was elected vice president at the August meeting of the Board of Directors of the company. Ralph B. McKinney, assistant general manager, has been appointed to succeed Mr. Stull as general manager of the department.

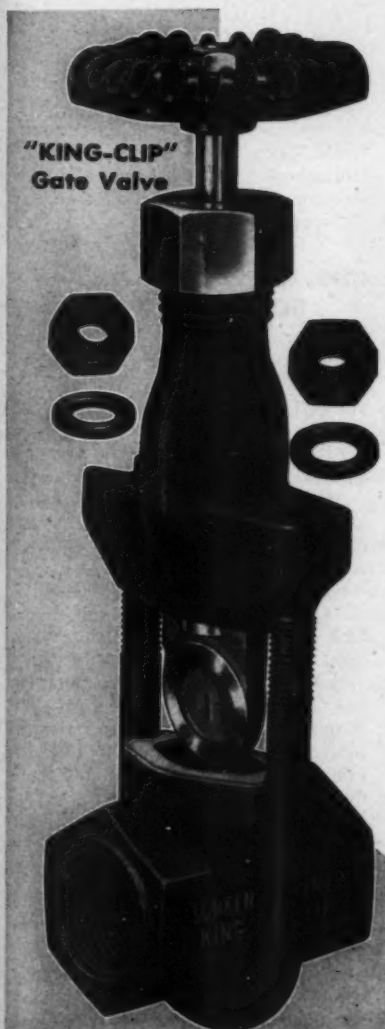
Mr. Stull, who served as general manager of the department for the past six years, became associated with Hercules in 1926, when the Virginia Cellulose Company of Hopewell, Virginia, of which he was president, was acquired. He was named general manager of the newly established Virginia Cellulose Department with headquarters in Wilmington. In 1933, he was elected a director, and four years later, transferred to the Paper Makers Chemical Department as its head.

Mr. McKinney has been with Hercules since its founding 31 years ago. He was the first director of the company's purchasing department when that unit was established in 1918. He was transferred to the explosives department in 1929, serving in sales as assistant to the general manager. In 1932, he was again named director of purchases, and in 1937, transferred to the Paper Makers Chemical Dept.

Simplicity of Design
Means Easier Maintenance

Easy Servicing - -

A Help for the Maintenance Man



So simple in design, so sturdy in construction, so resultful in last-ability is the "King-clip" valve, only a minimum of maintenance is required to keep it in good working order. And when service is required, the ease with which the valve can be disassembled is a real time and labor saver.

The illustration shows the ready accessibility of all parts for inspection and repairs and how few parts there are. Any maintenance man knows that this provision for quick servicing is a long step toward the uninterrupted production hours he is striving for.

A further aid to the attainment of easier and more efficient maintenance is the precision-gauged manufacture of replacement parts, assuring an exact duplicate of any part that may have to be renewed.

The "King-clip" is built for tough going and with ordinary care it will keep on delivering production hours at the lowest possible maintenance cost.

A Lunkenheimer distributor is near you to help you get what you need. His complete facilities are at your service.

Here's how easily the "King-clip" valve can be disassembled - - - - -

Unscrew two nuts at top of clip and entire bonnet-stem-disc assembly can be lifted from the body. Complete accessibility for inspection or repairs is the work of a few minutes.

• • •

Circular No. 504 is fully descriptive of the "King-clip" Valve. Get a copy from your Lunkenheimer distributor or write us direct.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI 14, OHIO, U. S. A.
NEW YORK CHICAGO
BOSTON PHILADELPHIA
EXPORT DEPT., 349-351 HUDSON ST., NEW YORK 13, N. Y.

BRONZE, IRON, STEEL AND CORROSION RESISTANT ALLOY VALVES, 125 TO 2500 LB. S.P.;
BOILER MOUNTINGS, LUBRICATING DEVICES, AIRCRAFT FITTINGS

HAMMERMILL OFFICIALS MARK SERVICE RECORD

Forty-five years of service with the Hammermill Paper Company, Erie, Pennsylvania, were recently completed by Dr. O. F. Behrend, treasurer, and F. P. Klund, advisory engineer and an assistant secretary of the company. Mr. Klund joined the organization on August 12, 1898, six weeks after its founding, and is outranked in service only by Dr. Behrend, one of Hammermill's founders.

Donald S. Leslie, first vice president and general manager, observed his 15th anniversary with the company.

◆

HERCULES APPOINTS MAYFIELD ASSISTANT GENERAL MANAGER

Hercules Powder Company, Wilmington, Delaware, has announced the appointment of Paul Mayfield, director of sales of the Naval Stores Department since 1939, to assistant general manager.

Mr. Mayfield joined Hercules in 1926 as a chemist. In 1930, he made a trip around the world for the company, specifically investigating Hercules' cellulose products and naval stores possibilities in Australia and New Zealand. He was subsequently transferred to Chicago to supervise the sale of cellulose products, and in 1934, was appointed manager of the Chicago naval stores branch office. He returned to Wilmington in 1936, as assistant director of sales for the department.

◆

CALCO APPOINTS MOODY ASST. GEN. MANAGER

Sidney C. Moody has been appointed assistant general manager in charge of all departments in the Calco Chemical Division of American Cyanamid Company, Bound Brook, New Jersey.

With the Calco organization since 1919, Mr. Moody has been a department sales manager for many years, and his activities have covered all phases of the business of manufacturing and selling organic chemicals and dyestuffs.

◆

STUART MADE MGR. OF WESTINGHOUSE LAMP DIVISION

Ralph C. Stuart has been appointed manager of the Lamp Division of the Westinghouse Electric and Manufacturing Company, with headquarters in Bloomfield, New Jersey. In this new position, he will have charge of all activities of the Lamp Division, including sales, illumination engineering, and district office activities, as well as manufacturing and engineering in the Division's five plants in New Jersey and West Virginia.

Mr. Stuart came to the Bloomfield headquarters plant of the Lamp Divivion in 1941, being transferred from the West plant of the Canadian Westinghouse Company at Hamilton, Ontario, where he had been manager from 1930 until 1941. He has been with the company for 25 years, having joined the Bloomfield works in 1918 as an assistant foreman.

◆

RICHARDSON IS NOW GEN. MGR. OF ALL TIMKEN DIVISIONS

W. H. Richardson has recently been appointed general manager of all activities of all divisions of The Timken Roller Bearing Company (Canton, Ohio) on the entire West Coast and in the Orient.

Mr. Richardson joined the company in 1917, serving in various sales capacities until 1929, when he was made

W. H. Richardson

manager of The Timken Roller Bearing Service and Sales Company and vice president of The Timken Roller Bearing Company, Ltd., Canada. In 1941, he was made assistant general sales manager of Timken, and has been devoting much of his time to the study of the development of the post-war markets for the various products of the company. In this connection he has spent the last two months in the Pacific Coast states.

The territory to be developed under Mr. Richardson's supervision includes the 11 western states, Washington, Oregon, California, Arizona, Nevada, Utah, Idaho, New Mexico, Colorado, Wyoming and Montana, plus the entire Orient, including the Philippines and China. He is planning to make his headquarters in San Francisco.

▶▶▶ Five new members have been added to the staff of Foster D. Snell, Inc., Brooklyn, New York. Assigned to the physiological and organic department are *Harold Moore Schiller*, formerly with the Norda Essential Oil and Chemical Company, and *Arthur Streuli*, recent Lehigh University graduate. *Henry A. Tisch*, formerly with the American Chicle Company, has joined the physical chemistry department, and *Robert W. Pease*, formerly with Calco Chemical Company, is now doing research in the rubber and plastics department. The special research department has added to its staff *Ida Borowich*, recent Hunter College graduate.

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▶▶▶ Hollingsworth & Whitney Company, Boston, Massachusetts, has announced the appointment of *Jack B. Cowie* as New York sales manager. Mr. Cowie has been with the firm since 1930. In 1935 he was made manager of wrapping papers, and in 1942 was made manager of paper shipping sacks. Before his association with Hollingsworth & Whitney, Mr. Cowie was connected with the Orono Pulp & Paper Company.

◆

GEO. CARLTON WILL SUCCEED ROBT. KOHS

George N. Carleton has been appointed general superintendent of the Detroit Sulphite Pulp & Paper Company, Detroit, Michigan. He succeeds Robert F. Kohs, who has retired (Cf. *P.I.* & *P.W.*, July, 1943, p. 416).

Mr. Carleton has been associated with the company for 16 years. For the past 6 years he has been assistant general superintendent.

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▶▶▶ *George Welp*, advertising manager of International Printing Inks, division of Interchemical Corporation, has been elected a member of The War Advertising Council, Inc. He will represent the Graphic Arts Victory Committee, which is affiliated with the Council. Mr. Welp has served on the executive committee of the Graphic Arts Group since its formation early this year.

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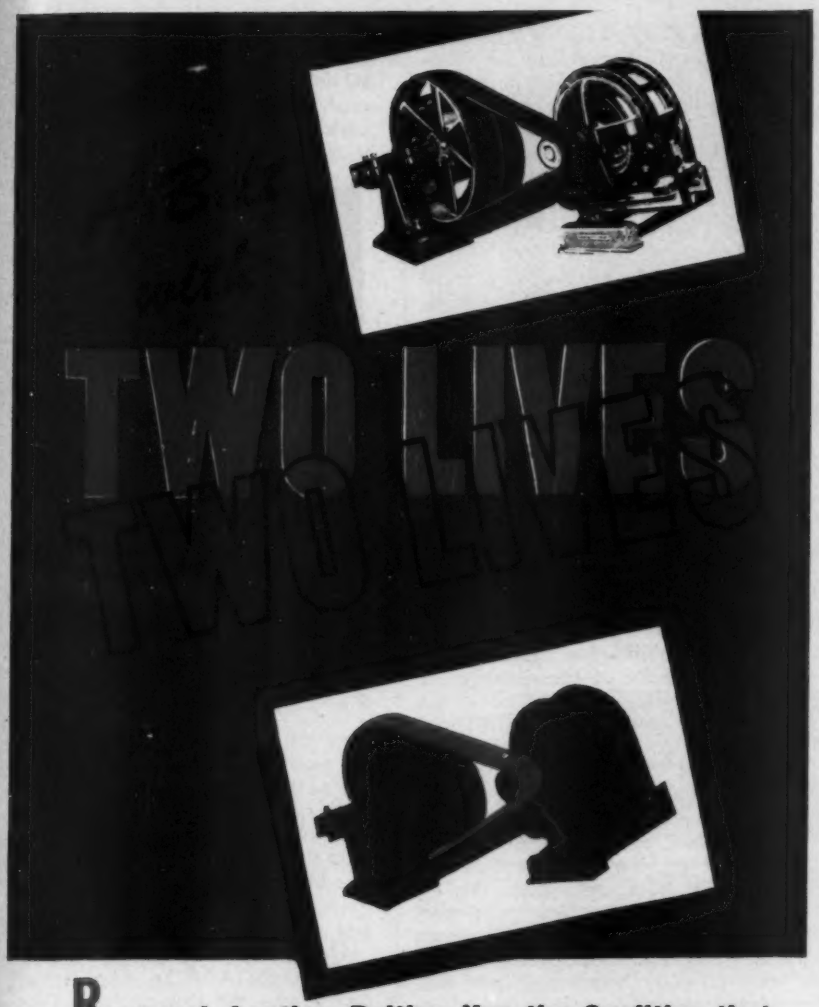
▶▶▶ At a recent meeting of the Board of Directors of the Scott Paper Company, Chester, Pennsylvania, the following executives of the company were elected to the board: *J. L. Ober*, acting vice president; *W. R. Scott III*, secretary-treasurer, and *Francis W. Plowman*, manager of distribution research and development. Mr. Plowman also was named general sales manager.



Research Leather Belting Has the Qualities that Give Longer Life in Paper Mill Service

Waterproof. Moisture conditions do not affect Research because the leather is waterproof and the belt is put together with waterproof cement.

Built-in pulley grip. Research keeps machines up to speed by delivering maximum power *with less belt tension.*

Greater pliability. Research withstands constant flexing over small pulleys.

Natural overload capacity. Research is ideal for such drives as beaters and jordans.

Less stretch. Removal of initial stretch during manufacture, together with high tensile strength, means less lost time for take-ups.

RESULT: Research leather belting will serve you longer than any other belting (on a pivoted motor base drive, Research will have at least double the life of a rubber V-belt).

No wonder more pulleys are belted by Research than by any other brand!

Graton & Knight is the only leather belting manufacturer with complete nation-wide service facilities. Branches in Chicago, Cleveland, Dallas, Detroit, Kansas City, Minneapolis, New York, Philadelphia, St. Louis, San Francisco; distributors in all industrial centers.

GRATON AND KNIGHT

GRATON & KNIGHT COMPANY

WORCESTER 4, MASS.

Look under "Graton & Knight" in Belting section of Classified Telephone Directory or THOMAS' REGISTER.

PERFECT *BALANCE* IN A LEATHER BELT

Modern mechanical methods replacing hand methods in the manufacture of leather belting are responsible for the increased machine production and longer belt life obtainable with Research Leather Belting.

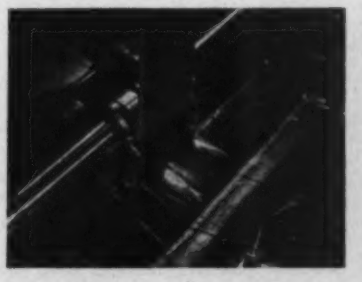
Leather is naturally the ideal medium for power transmission — low cost, greater frictional pulley grip, greater overload capacity, ease of installation, longer life. By overcoming its one disadvantage — the natural variation in the thickness of the hide — Graton & Knight provides a leather belt with perfect balance.

Graton & Knight does this, by depending upon mechanical means, rather than hand methods, to select uniform thicknesses. The Graton & Knight Belt Thickness Machine stamps the exact thickness to an accuracy of .008" in 185 places in the average-sized belting bend. Guesswork is completely eliminated; the leather is cut, scientifically, into strips of uniform thickness, insuring perfect *balance* in the running of the belt.

GREATEST BELTING ADVANCE IN 50 YEARS

Again, in the cementing of laps and plies, a Graton & Knight patented development provides uniform cement coverage of every part of the cemented surfaces to be joined — more permanent adhesion.

Replacing hit-or-miss hand methods, the Graton & Knight Belt Cementing Machine applies the cement with perfect uniformity and does the pressing in one continuous operation — all while the belt is *under working tension.*



So Research Belting is cemented to stay, because the cement is uniformly distributed and the cement line is the same length as that of the belting. Furthermore, the cement is waterproof, extremely flexible and heat resistant.

Graton & Knight's *tension cementing* is the most important development of the last 50 years in manufacturing leather belting. It means that you can expect top performance and longer life with Research Leather Belting.

PERSONNEL CHANGES AT INTERNATIONAL NICKEL COMPANY

T. H. Wickenden has been appointed manager and H. J. French assistant manager of the Development and Research Division of the International Nickel Company, Inc., New York City.

Mr. Wickenden, who has been assistant manager of the division since 1931, succeeds the late Albion James Wadhams. He has been with International Nickel since 1922, when he was placed in charge of developments in the automobile field for the development and research department at New York. Numerous inventions connected with the use of nickel in cast iron are credited to him, and his papers and engineering data sheets on the use of nickel in steel and cast iron have been widely published in trade journals.

Mr. French is temporarily serving in the Steel Division of the War Production Board in Washington, D. C. He has been in charge of alloy steel development in the company's Development and Research Division at New York since 1932, previous to which he had been a member of Nickel's Research Laboratories in Bayonne, New Jersey, for three years.

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▶▶▶ The Menasha Products Company, Menasha, Wisconsin, has made several changes in sales personnel recently. *Willard Charles,* Menasha representative in Pittsburgh, was inducted into the armed forces in July, and *Gordon Becker,* who formerly represented the company in St. Louis, is being transferred to Pittsburgh. *Harry Smart,* formerly of the Indianapolis territory, will take over the St. Louis territory, and *Lowell Nichols,* a new Menasha salesman, will have charge of the Indianapolis territory.

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▶▶▶ *S. R. Kallenbaugh* has been appointed West Coast district manager of the Steel and Tube Division, Timken Roller Bearing Company, Canton, Ohio. Until his recent appointment, Mr. Kallenbaugh was metallurgical service representative for the company in Cleveland and Detroit. In his new position, he will have headquarters at the company's Western offices located at 1526 South Olive Street, Los Angeles, California.

◆

▶▶▶ President of the British Columbia Pulp and Paper Company, Vancouver, British Columbia, *Lawrence Killam* has been appointed regional advisor to the federal wood and coal controller. Mr. Killam's special job will be to slash red tape and speed up action on fuel problems in Vancouver. He will not assume the responsibilities of the regional wood fuel controller at Vancouver, and it is not expected that his new position will interfere with the execution of his duties as president of the British Columbia Pulp and Paper Company.

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▶▶▶ *C. Allen Mayhew,* vice president and treasurer of the Sidney Roofing Company, Victoria, British Columbia, on leave for the duration, is missing in action somewhere in the Indian Ocean. A pilot in the Royal Canadian Air Force, he was flying a Catalina flying boat on a tour of duty from his airport in Ceylon when last heard from in mid-June.

◆

JOHN EASTON HAS BECOME ASSOCIATED WITH WHITING CORP.

John Easton, of the Civil Aeronautics Administration, has been appointed director of the development and standardization activities of the Whiting Corporation, Harvey, Illinois, succeeding A. J. Brown, who has been transferred to California to be manager of the Pacific Coast Branch.

Mr. Easton was born and educated in Scotland, having a degree in mechanical engineering from the University of Edinburgh. Since his arrival in America a few years after World War I, he served first with the Chrysler Corporation as an engineer on plant layout, and later with several aircraft companies in an engineering capacity. He has been connected with the Civil Aeronautics Administration since 1930, his most recent position being chief of the technical development division.

In his new position with the Whiting Corporation, Mr. Easton will have a broad field in which to apply his talent and experience.

Necrology

CHARLES LEWIS ELLIS

The news of the sudden passing of Charles Ellis, president of Downingtown Manufacturing Company was a shock to the entire industry and its affiliates. Mr. Ellis had started home for lunch Tuesday, August 30, and when his car developed a flat tire he started to walk up the hill to his home. He was found beside the road by acquaintances. He was 72 years of age.

Charles Lewis Ellis was a native of Boston where he attended M. I. T. He had a natural inventive ability and was largely instrumental in the conception and development of the Downingtown suction roll and extractor business.

Mr. Ellis was the fourth president of the Downingtown Manufacturing

Charles L. Ellis

Company, succeeding Albert H. Standley, who passed away in 1941. He started to work for the company in December, 1911, prior to which he had been superintendent of the Pont Rouge Canadian mill of Bird & Son, Inc. Before becoming president of Downingtown, Mr. Ellis had been sales manager and vice president.

He is survived by his widow and a son, Enright A. Ellis, who is connected with the Downingtown Company.

◆

WILLIAM A. WRASE

William A. Wrase, sales manager and vice president of the Central Paper Company, Inc., of Muskegon, Michigan, passed away on July 19.

Mr. Wrase's career in the field dates back to his association with the old Manufacturer's Paper Company of New York in 1902. He became sales manager of the Central Paper Company in 1932, and was elected vice president in 1934.

Mr. Wrase was 61 years of age. He is survived by his widow, two daughters, and one son.

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▶▶▶ A vice president and manager of the Development and Research Division of The International Nickel Company, Inc., New York City, *Albion James Wadhams* passed away on August 22. Mr. Wadhams has been with The International Nickel Company and its predecessor companies since 1901. He was 68 years old, and is survived by two daughters and two sons.

▶▶▶ One of the outstanding figures in the St. Maurice Valley, Canada, for many years and a pioneer in the building of the newsprint industry for which the region is particularly noted, *William P. Grant* passed away on August 26. Mr. Grant had been associated with the St. Maurice Lumber Company, which had its headquarters at Three Rivers, and the Canadian International Paper Company. He was 71 years of age.

◆

WALTER S. HALEY

Walter Stillman Haley, retired pulp expert, passed away at his home August 6, at the age of 77.

Mr. Haley entered the pulp industry in 1890, when he obtained a minor position with the Eastern Manfacturing Company, South Brewer, Maine, and was employed in that industry in increasing responsible positions until his retirement five years ago. He was associated with the Oregon City (Oregon) plant of Crown Willamette, the Marinette Paper Company, Marinette, Wisconsin, and the Parker-Young Company, Lincoln, New Hampshire.

Mr. Haley was also employed for several years as a pulp expert by E. R. Barker, Boston, Massachusetts, and in that capacity installed the Barker acid system in mills all over the country. Of an inventive mind, he originated a number of improvements in the sulphite process, his last invention being the Haley-Hardy valve, which was patented and is sold by the W. A. Hardy Company, Fitchburg, Massachusetts.

He is survived by his widow and a daughter.

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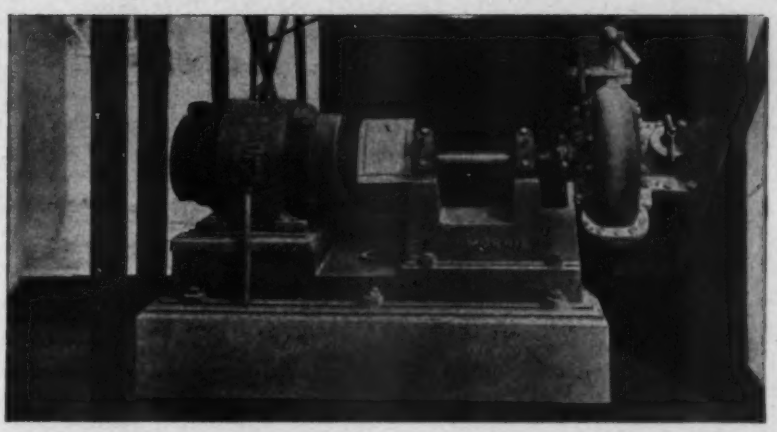
▶▶▶ *Ward W. Pickard,* deputy administrator of the National Recovery Administration in 1933 and head of its paper and pulp division, passed away at his home in Nutley, New Jersey, on August 23. As head of the paper and pulp division, Mr. Pickard played an important part in drafting codes governing the industry, and was appointed co-ordinator of the paper and pulp industry in 1934, in which work he continued until 1936. He was 65 years old, and is survived by his widow, two sons, and a daughter.

◆

▶▶▶ Recognized as an international authority on steam power plants and boiler design, *F. H. Rosencrants,* vice president of Combustion Engineering Company, Inc., New York City, passed away August 26. Mr. Rosencrants was a member of the A.S.M.E. and the British Institute of Electrical Engineers.



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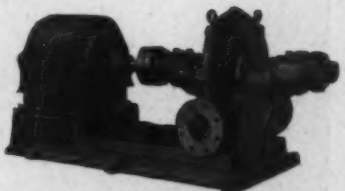

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CENTRIFUGAL PUMPS

Merfenelopes—a New Reagent for Controlling Slime in the Manufacture of Food Papers

HAROLD R. MURDOCK*

▶▶▶ ELIMINATION OF slime troubles in paper mills by the use of phenyl mercuric compounds is an outstanding accomplishment of recent years. A few mills which manufacture food papers still hesitate to use mercurial compounds because of the erroneous belief that the paper might retain sufficient residual mercury to render such paper unfit for its purpose. This point of view exists because there has not been any logical appraisal made of this subject. This article will show that there is no foundation for such a belief. In fact the use of phenyl mercuric compounds in food papers is desirable as a hygienic measure. Food papers should be free from bacteria and mold, and the elimination of slime from the paper mill is a long step forward toward improved sanitation in food papers.

The phenyl mercuric compounds were first called to the attention of the medical profession by Weed and Ecker, who noted that these compounds possessed unusual bactericidal and fungicidal properties, together with very low toxicity to humans (*8*). The ratio of antiseptic power to toxicity is outstandingly favorable as compared to other chemicals used for this purpose. These phenyl mercuric salts, which have been extensively studied medically by Weed and Ecker (*1, 2, 3*) Birkhaug (*5*), and Biskind (*6*) and others, have an excellent medical background. The Hamilton Laboratories, Inc., has acquired the patent rights of Weed (*4*), and has accumulated a comprehensive clinical experience on the oral administration of these chemicals to humans which well justifies the use of these salts internally. The American Medical Association (*8*) has approved the use of Phenyl Mercuric Borate, Phenyl Mercuric Nitrate, and Phenyl Mercuric Picrate, for use in treating skin diseases, and mucous membranes.

The Hamilton Laboratories has recently extended its activities to the industrial application of these compounds under their trade name "Merfenel," as compared to their trade-mark "Merphenel" used on medical products. A blend of these salts with other ingredients is marketed to the paper industry in small paper envelopes which can be added to the beater directly without opening the envelope. These envelopes are sold under the trade-mark "Merfenelope." It has been proven repeatedly that such a treatment for slime prevention in paper mills is simple and efficient and uses an amazingly low amount of material. One ounce of these salts to a basis of ten tons of paper has been found adequate in many mills. Some mills are obtaining excellent results with one ounce to twenty tons of paper. The dosage depends upon several factors, two of which are the amount of infection present in the system, and the water conditions. Experience has shown that when a system is operated for three or four days at a dosage of one ounce to five tons the entire system becomes free of slime, and the dosage can be reduced and kept at one ounce to fifteen or twenty tons of paper indefinitely.

In order that we may calculate the residual mercury left in paper from such treatment of the paper mill system, let us assume that the following conditions are existent: first, that the mercury added to the system is all present in the paper, and second, that we treat the system at the abnormally high concentration of one ounce to five tons of paper. The evidence is so much in favor of lack of toxicity in the food papers that we can make these over assumptions safely. Calculation shows that the paper will contain 0.000625 per cent phenyl mercuric acetate under these conditions. Inasmuch as this salt contains about 60 per cent mercury, the percentage of metallic mercury based upon the paper will be 0.000375 per cent. This is an infinitesimal amount. It should be understood that actually the greater part of the mercury will pass off with the white water and will not be found in the paper, also, the probable dosage will be only about one-third of the amount shown in these calculations.

Let us assume that a person eats daily one pound of paper, or that the food which might be wrapped in this one pound of paper completely absorbs all of the mercury carried in the wrapping paper. This is probably more paper than a person's food is wrapped in each day. However, in spite of this ridiculous premise, let us see what are such a person's chances of becoming poisoned with mercury. This one pound of paper, according to the above calculations, would contain 0.00000375 pounds of metallic mercury if as we assumed all the organic mercurial is absorbed by the paper in its manufacture. This is 1.7 milligrams when stated in the unit preferred in comparing medical dosages. We will now consider such comparisons.

Modern medicine requires a large amount of blood plasma. It has been clearly established that the use of blood plasma for maintenance of blood pressure, blood volume, and serum proteins, in the treatment of shock, burns, and hemorrhage, is of great practical significance. Few people realize that most, if not all, blood plasma is preserved with an organic mercurial compound. (The Hamilton Laboratories is an important source of these organic mercurials.) The method of packaging dried blood plasma, to make it available for immediate use in treating casualties occurring in military operations, has been carefully worked out. The package consists of a fibreboard box containing two rubber-diaphragm-capped 400 cc bottles. One bottle contains dried plasma obtained from 250 cc of original normal plasma, sealed under a high vacuum. The label of one manufacturer, Sharp & Dohme, states that the bottle also contains one part of phenyl mercuric borate for every 25,000 parts of plasma. According to that, the bottle con-

(*) Vice president, The Hamilton Laboratories, Inc., Asheville, North Carolina.

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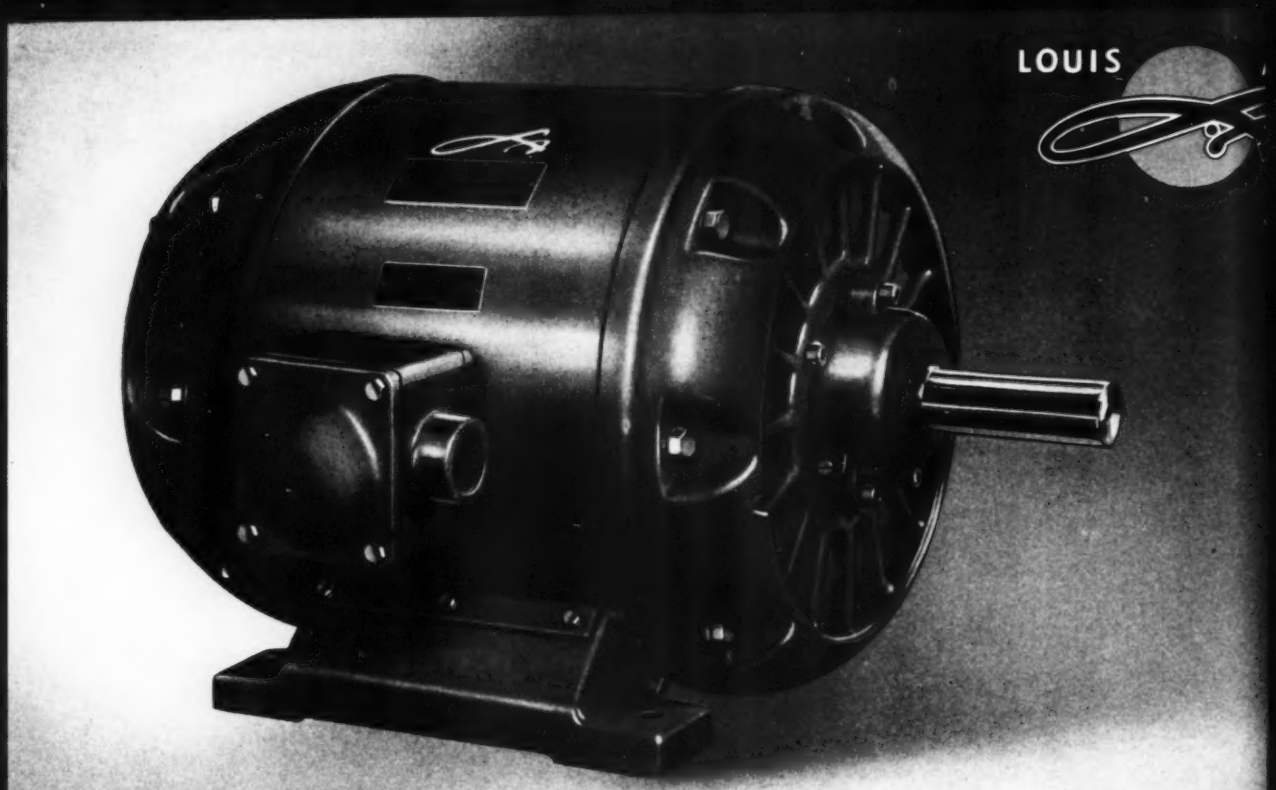

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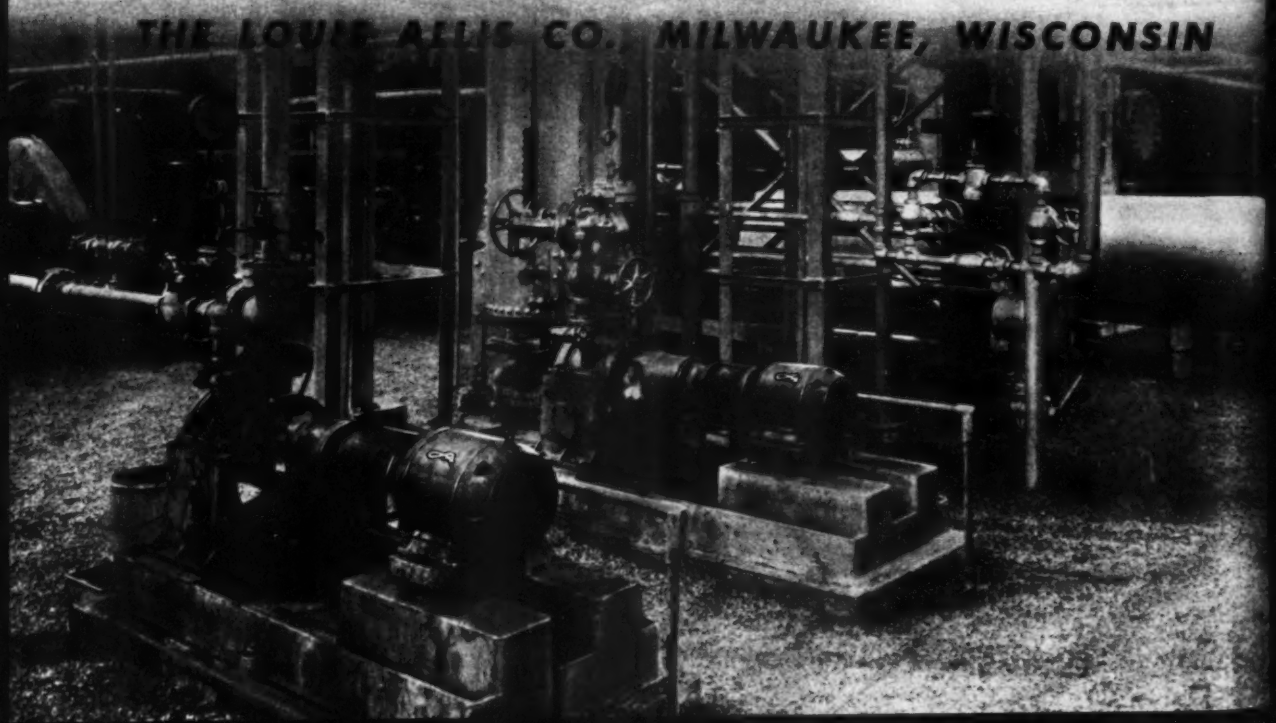

tains 10 milligrams of phenyl mercuric borate, or 6 milligrams of metallic mercury. The other bottle in the kit contains 250 cc of sterile distilled water sealed without vacuum. This particular producer advises that the contents of the second bottle contains one part of phenyl mercuric borate to 100,000 parts of distilled water. Therefore, this bottle contains 2.5 milligrams of phenyl mercuric borate, or 1.5 milligrams of metallic mercury.

Consequently, when one blood plasma treatment is given, the patient receives 7.5 milligrams of metallic mercury. This is over four times more mercury than he would take into his system if he ate the one pound of paper mentioned above. Strumia (9) mentions that "as much as 7,300 cc of plasma has been given during eleven days, and 950 cc at a single dose." From the foregoing it is certain that food papers are safe.

The Hamilton Laboratories has manufactured mercuric compounds for a period of eight years. The personnel of this organization who have been working with organic mercurials during this entire period have shown no evidence of mercurial poisoning. This is an important point, for each day these operators are exposed to the dust occurring in the manufacture. The company has clinical data on numerous cases where intravenous treatments have brought about recoveries of remarkable character. For oral administration ten milligram capsules of phenyl mercuric chloride have been given daily over extended periods without an indication of toxicity from mercury.

A few specific clinical cases show the safety in using these mercurials internally. One case is that of a boy fourteen years old, who had undergone a mastoid operation and developed a blood poisoning following it. He had been treated for about a week by the usual methods that were known, without favorable results. His temperature was 103 when it was decided to give him an injection of 50 milligrams of phenyl mercuric gluconate in the vein. The solution used was one part of phenyl mercuric gluconate in 200 parts of distilled water. A smaller injection was given the day following, and on the second day a heavy injection of 250 milligrams was given to the boy. There were no ill effects, and a test of the boy's blood stream showed absence of bacteria, and he was released soon from the hospital as cured.

Another instance was of a man who had septicemic blood stream infection due to a green pus producing organism. It had been the experience of the hospital that every case that developed the green pus in the blood died. There had been no exception to this rule. This man was moribund. As a last resort, 200 milligrams of phenyl mercuric gluconate was injected in his veins. The next day his temperature dropped from 105 to 100. Another 200 milligrams was consequently given intravenously, and the next day his temperature was normal, and he made an uneventful recovery from his illness.

Clinical studies have shown that the phenyl mercuric reagent forms phenyl mercuric chloride in the blood stream due to reaction with the saline solution. This

The Wayside Inn still stands as a symbol of hospitality to the dusty traveler. Here the coach horses were changed and the post was forwarded. The atmosphere was club-like and cheery. The open fire danced upon the hearth. The candles spluttered on the table, around which the guests gathered for a game of cards, while mine host and his wife were "a bustle" to serve a fine meal. It is still the proud boast of many a New England Inn that "Washington slept here."

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chloride has a solubility of but one part in 20,000 parts of water. Tests confirm that this phenyl mercuric chloride is eventually excreted as such to a very large extent. Consequently, it does not remain in the system to create an accumulative condition.

In conclusion, it is definite that much sound medical information is available to prove that no injury to the individual is experienced when phenyl mercuric salts are taken internally in amounts up to 200 milligrams per day for several days. In comparison with this medical evidence, this article has shown that the amounts of mercury present in food paper made in mill systems using phenyl mercuric salts will contain a very much lower content of mercury. It further shows that if taken into the system by means of food absorption the trace of mercury introduced is much too small in amount to produce ill effects.

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Convention Papers . . . Abridged

Drainage and Steam for Paper Machine Dryers

RODERICK O'DONOGHUE, Consulting Engineer

There are mills that would like to improve their dryer systems to meet certain requirements and are handicapped due to wartime restrictions. These requirements might be in one or more of the following directions: (1) increased evaporation per square foot of dryer surface, (2) reduced drying temperatures, (3) graduated dryer temperatures, (4) greater dryer steam economy, (5) more uniform drying, and (6) decreased mechanical load on dryer section.

The usual factors affecting dryer heat transfer are: (1) steam pressure in dryer, (2) air in steam, (3) water in dryer, (4) coating on inside of dryer, (5) coating on outside of dryer and rough surfaces, (6) poor contact of sheet to dryer, (7) thickness of shell and material used in construction of dryers, (8) dryer contact area, (9) temperature and moisture content of contacting sheet.

What we are trying to accomplish with a dryer is to maintain a temperature differential between the dryer surface and the sheet.

The differential will vary from dryer to dryer depending on the surface temperature of the dryer and that of the sheet and the rate of heat transfer from one to the other. It may be necessary to limit heat transfer at the early stages so as to prevent blowing, searing, cockles, and too rapid shrinkage. As the temperature of the sheet increases, higher dryer temperatures are desirable to get the required heat transfer. Therefore, it may be an advantage to have the dryers broken up into various pressure sections, especially where it is necessary to make the most of a limited dryer surface.

Air and steam when once mixed cannot separate in the dryer to form pockets as some claim. The "law of diffusion of gases" and the movement due to incoming steam and the revolving dryer preclude this. Therefore, to eliminate air, we must discharge steam as well.

The effect of air in steam is to lower the steam temperature at a given pressure and to reduce the coefficient of heat transfer.

The conductivity coefficient of iron is about 100 times that of water. This indicates water would be a good insulation if at rest, but this condition does not hold true in a revolving dryer. At slow speed a puddle is formed in the bottom while thin film of condensate or dropwise condensatiton (Jacob, Max, "Heat Transfer in Evaporation and Condensation" *Mech. Eng.* p. 729, Nov., 1936; *The Dominion Engineer*, Dominion Engineering Co., Ltd., of Canada, Dec., 1939) covers the remaining surface.

At high dryer speeds, centrifugal force changes the puddle to a solid ring or film of water extending around the entire periphery of the dryer. There is some "slip" between the iron surface and this ring so that the water is not at rest, but if this ring is not kept small in depth we should expect some insulating effect.

The effect of good contact of sheet to dryer and a highly polished surface is emphasized when we compare evaporation rates with a Yankee dryer which may be five times as great.

The use of cast iron has been dictated by practical considerations. Some fabricated steel dryers have been built using thinner shells for the same pressure with claims of a possible heat transfer per unit area nearly in proportion to the thickness. This ignores film coefficients which are of dominant importance.

Dryer contact areas usually vary between 50 and 66 per cent, and even larger on Yankee dryers.

Large contact area is particularly desirable on feltless machines where evapora-

This section includes abridgments of papers presented at the annual meeting of the **Technical Association of the Pulp and Paper Industry,** held in New York City, February 15-18, 1943. This is the seventh installment.

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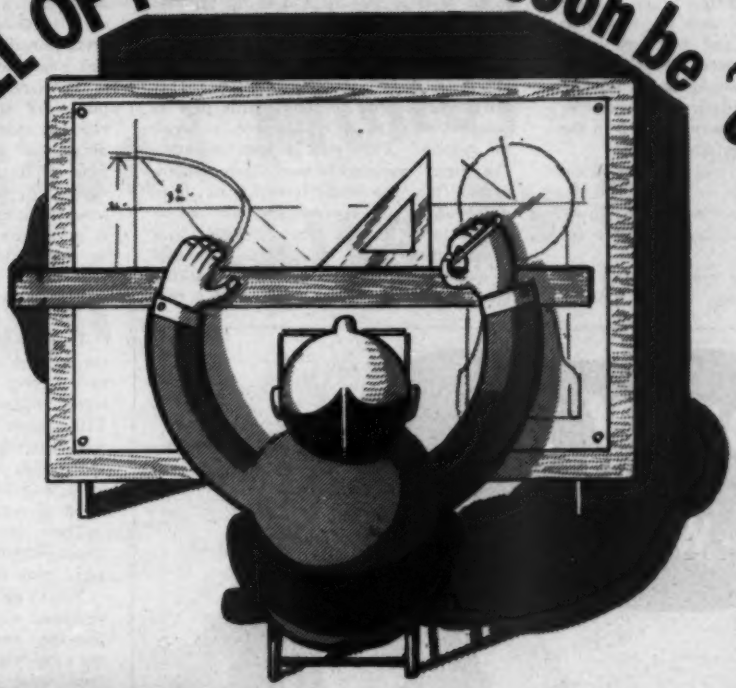

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tion takes place up to the end of contact with the dryer.

Cowan (Cowan, E., and Cowan, B., "A Theory of Paper Drying," *Tech. Assoc. Papers* 20:271, 1937) takes the view that a felt is an insulator and that most evaporation takes place between the draws. If this were so, there would be a limit to worth-while dryer contact area and diameter of dryers with a consequent increase in the number required where felts are used.

A good steam joint will not suck in oil or air when the dryer is under vacuum, and will not blow steam when under pressure. Its pipe sizes should be ample for all possible conditions.

A syphon pipe can function as a real syphon and as an orifice.

Where the condensate return line is closed, as with individual traps or check valves, sufficient water must accumulate in the dryer to seal the end of the syphon. Steam sealed in the return line will condense reducing the pressure and cause water to rise in the syphon pipe until it overflows and forms a real syphoning action. This will continue until the end of the pipe is unsealed and enough vapor enters to break the syphon. The cycle is then repeated. The "head" required to start syphon action is that from the water level in the dryer to the top of the syphon pipe line and to give velocity to the water. After once started, the "head" required is only that to overcome friction and produce velocity. The disadvantage of cyclic operation is that heat transfer may not be uniform and dryer load will vary.

In a "blow through" system, there is maintained a pressure differential between the return header and the inside of the dryer to make water rise in the syphon pipe and then flow out. This is greater than is necessary to continue the syphoning action once started and as a result some vapor is carried out, too. If the pressure differential is too great and the syphon pipe too large, a considerable amount of vapor will be carried over, making more condensing dryers necessary. A solution is to restrict the end of the syphon pipe so as to give such a high velocity at the inlet that a continuous stream of condensate and the proper amount of vapor is carried out.

To keep water in dryers to a minimum, the syphon ends should be adjusted close to the dryer shell. They will not function right if there are leaks in the syphon line.

If syphon pipe is not functioning, water will build up until it spills out the return line. This is objectionable because of the extra load to revolve dryers and insulating effect of water as already discussed.

There are two general types of dryer drainage systems: (1) individual traps, and (2) "blow-through."

Years ago many dryers were simply equipped with a valve on the return line, and this was periodically opened to blow out the accumulated condensate. Then traps were installed to do this automatically. If a trap is properly sealed to prevent steam blowing, then air will accumulate in the dryer. By-passes were installed to periodically relieve this condition by "blowing" past the trap. Then the trap was arranged to continually "blow" so as to relieve air. This practice is now more or less general so that we have in effect a blow-through system with need for some means such as condensing dryers to take care of the excess steam.

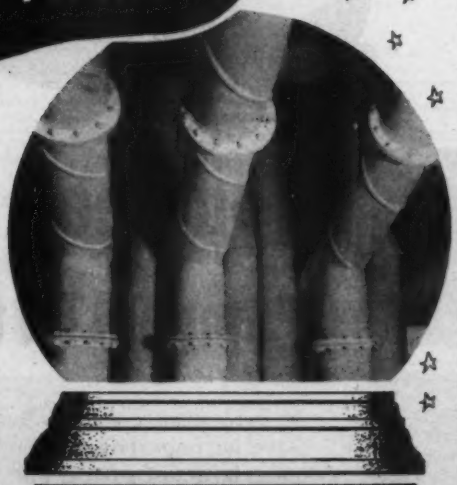
From the use of traps as just described came the idea of blowing steam from one set of dryers at the dry end into the next set which would act as condensers and thereby produce the necessary pressure differential to produce a flow of steam, air and condensate. It is possible to carry this idea to the extreme of passing in series from one individual dryer to another the full length of the dryer section, but this in general would not be practical as the pressure drop over the machine would be excessive. It is common, however, to have the dryers divided up into two, three, and sometimes four sections.

In a blow-through system all air finally reaches the last condensing section. The condensate discharge line contains steam as well as air and can be passed through a condenser to recover the heat before the air alone is expelled. A vacuum pump may be necessary to do this. Condensate from all sections is trapped and may be returned to the boilers.

The amount of steam obtained as flash steam due to the drop in pressure between sections is a comparatively small amount.

At the wet end it is generally desired to increase gradually the dryer surface temperature so as not to heat the sheet up to quickly. On some special papers it may be desirable to reduce the surface

A PEEK INTO POST-WAR PIPING



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temperature to say 140 Fahr. on the first dryer and gradually increase it to 212 Fahr. on the next four or five dryers. Steam at 140 Fahr. is at negative pressure of 24 inches Hg. Such a high vacuum would cause an unknown and controllable air leakage into the dryer. Stamm (Armstrong-Stamm graduated temperature control system) has worked out an arrangement to obtain controlled temperature in this range *admitting* air to the dryer.

Stamm (Stamm, F. C., "Factors Influencing Dryer Performance" *Paper Trade J.* June 11, 1931) states the average machine drying about 1 pound of paper per square foot per hour should have only 10-12 Fahr. average drop in temperature between steam inside the dryer and the outside surface; this drop is about 15 Fahr. at the wet end and 5 Fahr. at the dry end; that a drop of 5 Fahr. below these is equivalent to 10 per cent less dryer capacity, and one of 20 Fahr. of 50 per cent less capacity.

MacNaughton (MacNaughon, W. G., "Drying Rates of Newsprint," *Tech. Assoc. Papers.* 26, 1943) gives graphs showing steam and dryer surface temperatures which are interesting. For 22 machines, the average difference in temperature is 20 Fahr., the minimum is given as 6 Fahr., and the maximum 45 Fahr.

Another noticeable feature is the "saw-tooth" rise and fall in temperature of 10 to 40 Fahr. between top and bottom dryers on such graphs, the cause of which is unexplained. Possible factors are the condition of the dryer felts, and the air and vapor surrounding these dryers.

The surface pyrometer should be used as a regular routine to check up on the operation of individual dryers. It will indicate those which are water logged or air bound, and usually these troubles are due to defective syphon pipes or a poorly functioning drainage system.

The effect of removing a maximum amount of water at the presses and leaving in as much as possible at the dry end is to reduce the pressure on the dryers and the amount of steam used per pound of paper or to make possible a greater paper production.

Assuming a final moisture content of 8 per cent and that it requires 1.4 pounds of steam at 240 Fahr. to evaporate a pound of water in the dryers, 250 pounds more steam per ton of paper will be required for each additional per cent of water in the paper entering the dryer section. MacNaughon (MacNaughton, W. G., "Steam Saved by Better Water Removal at the Presses," *Tech. Assoc. Papers.* 25:377, 1942) gives information in connection with this subject.

The moisture remaining in paper usually varies between 2.5 and 10 per cent. When you get near these figures, any further drying is at the expense of disproportionately greater dryer surface or higher steam pressure. Overdrying should, therefore, be controlled. Wet streaks may often be traced back to poor sheet formation.

A factor in the drying capacity of a machine using dryer felts is the proper use of felt dryers (or air) to dry the felts, and raise their temperature. This water can be a good percentage of the total evaporated from the sheet depending on the type of felts used and other factors. The number and location of felt dryers and the method of "draping" the felts on them must be studied independently for each condition.

MacNaughton (Stickle, F. A.—From Bulletin No. 60 of Stickle Steam Specialties Co.) reports felt dryers for 50 newsprint machines. The percentage of total heated dryer surface varies from 0 to 19 per cent with an average of 7.55 per cent. There are cases where the percentage of dryer surface is even greater than the maximum figure just mentioned. Montgomery (Montgomery, A. E., "Drying Rate for Kraft Paper," *Tech. Assoc. Papers.* 25:511, 1942) reports a machine having 42 per cent of its total area in felt dryers and a comparison of its drying rates with other machines indicates the number is excessive.

A careful analysis of the way steam and condensate are handled on any paper machine may make it possible to obtain one or more of the six objectives outlined at the beginning of this article without any major changes in equipment.

Comparison of Calender Treatments

ALBERT YRAOLA, Chief Chemist
Hinde & Dauch Paper Co. of Canada, Ltd.

No. 1 patent coated paperboard was calender-treated on the paperboard machine with solutions, of several strengths, of

Testing is Your Protection

90,000 cu. ft. per min. turbine-driven blast furnace blower on test in De Laval Works

The De Laval Testing Division, which is operated as a separate department by competent men who devote their entire time to testing, is of benefit to purchasers of De Laval equipment in two ways:

1. Testing gives assurance that the apparatus meets guarantees as to efficiency, head or pressure, volume or capacity, etc., and that its mechanical operation is satisfactory.

2. The results of tests on each machine enable the De Laval designing engineers to improve and perfect the product.

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THE CORROSION RESISTANT ALLOY

Here is illustrated one of several Misco "C" fractionating towers on active service. Operating thousands of miles away from any source of replacement these towers are contributing to our war effort. They demonstrate the complete dependability of Misco "C". This is one of the reasons why Misco "C" is not available to all our customers.

Your own Misco "C" castings will continue to serve you as well. They seldom need attention and we hope they will last for the duration.

Until Victory is achieved we must continue to observe restrictions and priorities, but we are eager to serve our customers to the best of our ability.

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chlorinated starch, tapioca starch and polyvinyl alcohol, for purposes of comparison of the effects of these materials on the printing quality of paperboard. The effects on printing quality were determined by examining proofs from a precision proofpress, and by making wax pick tests, surface oil absorbency tests, and densometer tests for porosity. Precautions were taken to prevent significant variations in the board and calendering conditions during the manufacture of the board tested. The tests were made on board that would display the varying effects of the materials most clearly; it had an all bleached sulphite liner, and was well formed, hard sized, and highly finished.

An ordinary commercial grade of chlorinated starch, No. 1 quality tapioca starch, and a high viscosity polyvinyl alcohol were used. The upper limit of concentration of solution of each material was determined by the attainment of a viscosity somewhat above that which could be normally run on the calender stack of a board machine. This limit was at 16 per cent concentration for chlorinated starch, 4 per cent for tapioca and 6 per cent for the polyvinyl alcohol used. Usually, for example, 12 per cent concentration of chlorinated starch or 5 per cent of polyvinyl alcohol is not exceeded in practice.

The starch solutions were prepared by mixing the required amount of starch with half of the necessary water, added cold, and then heating until the starch gelatinized. The solutions were then brought up to volume with cold water, and allowed to cool to room temperature before using. The polyvinyl alcohol solutions were made by stirring the necessary amount of dry powder into half of the necessary water, heating to boiling, and then diluting to volume with cold water. These, too, were cooled to room temperature before using.

Increasing the concentration of each of the three solutions had the effect of raising the wax pick, surface oil absorbency, and air porosity of the board. The effect was much more apparent in lower concentrations for tapioca starch and polyvinyl alcohol than for chlorinated starch.

The most significant property from the viewpoint of board users is actual printing quality. Printed proofs showed that all three materials decreased the ink absorption (and therefore improved the gloss of the ink) as the solution concentration increased. If gloss printing, and therefore decreased surface absorbency, is desired it will be found that there is a minimum figure below which the surface oil absorbency cannot fall without adversely affecting the appearance of the result. If, on the other hand, an ink that dries partly by absorption is used it will be found that there is a maximum figure above which the oil absorbency (or porosity) cannot rise without retarding drying, and perhaps also causing shiny spots in what should be a flat ink.

Acknowledgment—Thanks are due to L. F. Winchell, vice-president and general manager of the Hinde & Dauch Paper Company of Canada, Limited, for the facilities for this work. Also to W. H. de Montmorency of the Gair Company of Canada for the densometer tests, and to J. T. Macdonald of the Hinde & Dauch Paper Company of Canada, Limited, for the graphs.

Improvement of Electrical Circuit in the News Penetration Tester

D. D. CAMERON[1] and W. C. KENYON[1]

Of the various ink tests available, the News penetration tester formerly manufactured by Barss, Knoble, and Young, and at present by Testing Machines, Inc., seems to offer a promising approach to the determination of colloidal solution transudation by scientifically sound principles. This instrument was the subject of one of the instrumentation studies made by The Institute of Paper Chemistry (*Paper Trade J.* 105, No. 26:35-42 Dec. 23, 1937). In that study several limitations were pointed out, including the effects of color and opacity.

It has been the experience of the Hercules Powder Company that results with the News penetration tester were nonreproducible, even though samples of closely matched color and opacity were used, and temperature and humidity were controlled. Two types of variation in the results were noted: (1) Random fluctuation in successive determinations on a given sample. (2) General increase or decrease, depending on the individual instrument, or values over a long-term period. The second type of variation fortu-

(1) Hercules Powder Company, Experiment Station.

Heavy rolls of soft asbestos in a California plant are taken to and from storage with this Cleveland Tramrail three-runway crane and motor-operated roll grab. The operator manipulates both crane and grab without leaving his cab.

CUTS ROLL HANDLING TIME

Because one operator in the cab of a Cleveland Tramrail Crane can handle rolls in and out of storage without any floor assistants, handling time per roll is cut greatly.

But that is not all! Costly roll damage due to crushed edges, cuts, tears, etc., is reduced. Storage capacity is increased by elimination of usual aisle space. Rolls can be piled far higher.

Regardless of the size of your plant, you should look into the possibilities of a Cleveland Tramrail System now.

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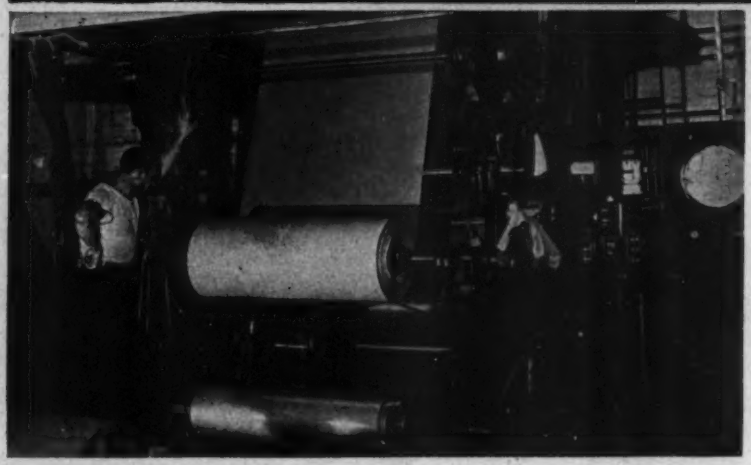
Speed Your Production

You Can STEP UP PRODUCTION And Turn Out A BETTER SHEET With NORWOOD CALENDERS



YOU can step up production and turn out a better sheet with Norwood Calenders because they have many modern time-saving features. New Norwood Calenders run faster, with a minimum of "broke" and mechanical delays. They have a new power-saving drive, a continuous oiling system, adjustable roll journal boxes, and many other features. Investigate.

Send For Engineering Data Units:
Helpful Data Units are waiting for you. Write today for your set.

Get a Good Start And a Good Finish With NORWOOD WATER FILTERS AND PAPER FINISHING MACHINERY

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nately was found amenable to correction or control.

Considering the News penetration tester structurally the principle of the instrument is to balance the output of two barrier-layer-type photocells upon which light falls from the same source, one beam of which is reflected from the sample, and the other from a movable plastic reflector. A neutral screen is then inserted in the latter beam to reduce its intensity to a known fraction of its original value. This unbalances the galvanometer. Ink is then brought into contact with the underside of the paper sample and the time is noted for the ink to penetrate the sample until the reflection of the sample is reduced sufficiently to bring the galvanometer back to balance again. This procedure gives a reproducible end point only when the two photocells have the same illumination-response characteristics.

A study was made to discover the cause of the general increase or decrease of values over a long period of time. It was found that the response characteristics of the two photocells in each of several instruments were considerably different. This allows unequal amounts of light falling on the two photocells to be judged equal. This is indicated by the fact that in at least two instruments checked by the authors, consistently different values were obtained when the two photocells were interchanged.

The two cells used in a given instrument may have the same general characteristics. However, the characteristics of one or both of these cells may vary considerably from a typical curve. The response characteristic is dependent upon the external resistance of the circuit. Thus when there is a high external resistance (of the order of several hundred ohms) the response is far from linear. There is also a considerable variation in the response characteristics of individual cells, for a given external resistance.

In a given instrument, if considerably different values are consistently obtained for samples of the same paper when the photocells are interchanged, it may be concluded that the results in either case will not agree with those obtained with other instruments. Furthermore, if changes should take place in the relative sensitivity of the photocells, the results may not be consistent even for one instrument over a period of time.

However, since it is possible to vary the response of the photocells by changing the external resistance, it is possible to modify the instrument to allow equal response from each photocell. This is done by the introduction of a rheostat-potentiometer.

Then by dividing this resistance suitably between the two halves of the circuit, the effective responses of two photocells can be made equivalent, although presumably neither will be linear.

A test for this condition of balance is as follows: The galvanometer is unbalanced when the screen is interposed between the light source and the plastic reflector. If, then, another screen having exactly the same transmission is inserted between the light source and the sample the galvanometer will return to zero when the photocell responses are equivalent.

In practice this amounts to the following procedure: First, balance the instrument as usual with no screens in the beam, using the movement of the plastic reflector to achieve this balance. Then insert the filter screen which is to be used to determine the end point in the usual manner. The galvanometer will now be unbalanced. Then, insert another screen having the same transmission as the first, between the light source and the lower photocell. If the galvanometer returns to balance, it can be assumed that the response of both photocells is the same and the true result will be obtained. If the galvanometer does not return to balance upon insertion of the second screen, the rheostat is varied until upon repeating the above procedure, the galvanometer balances, when both screens are out of the beam and again when both screens are in the beam.

Four instruments have been equipped with a potentiometer-rheostat in this laboratory, and tests with a number of samples indicate that, within the rather wide limits of experimental error at present associated with this test, all the instruments now give values which agree well.

The random fluctuation in successive determinations on a given sample previously mentioned apparently is due to factors of the sample — i.e., non-uniformity, from whatever cause — or the penetrant. No extensive study of the sheet factors responsible for non-uniformity of test results has yet been made, inasmuch as a close insight into this matter is expected from a concurrent research program, the results of which will be made known as soon as feasible. However, effort has been made to standardize the pene-

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THE PROCESS of wearing down the power of continued fighting is what military men call *attrition*. It was the strategy at Attu and at Pantalleria. Enemy resistance could not withstand the merciless, unremitting, high-speed gruelling of the machinery of war. • The felts on a paper machine are subjected to this kind of punishment. Their effective value is measured in their ability to withstand the attrition of long runs at high speed. • Hamilton Felts do just this. Once properly installed they seldom require time out for adjustment. They remove more water in less time and with less broke. Like good soldiers, Hamilton Felts do their duty at remarkably small cost.

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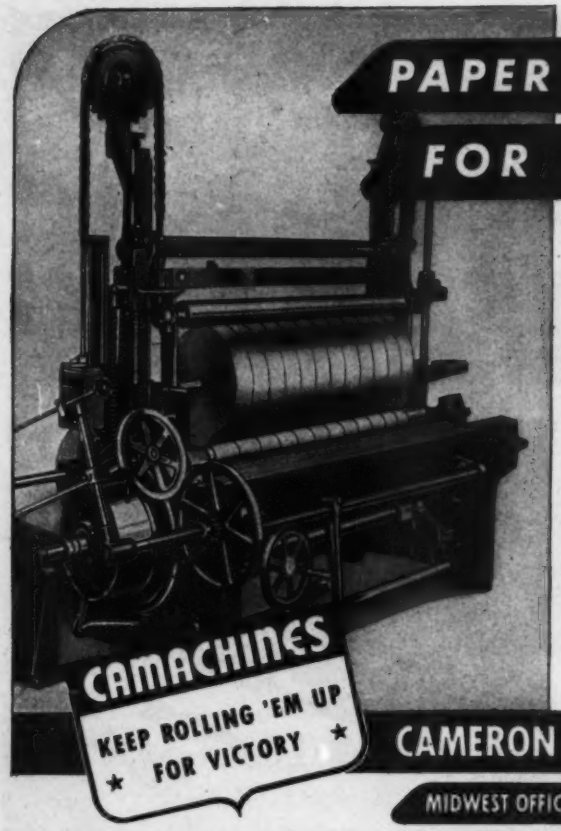
Miami Woolen Mills

Hamilton Felts

Established 1858



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Camachines play an important rôle in keeping our armed forces supplied with a tremendous flow of ammunition. Tons and tons of chipboard, wad paper, partition paper, and overlay stock are used in the manufacture of ammunition.

The machines which are used to process these papers must be supplied with rolls cut to the proper width and uniformly wound for easy handling. The processing machines are fast and they are running at top speed. It takes a fast sliter and roll winder to keep ahead of the pace. That is why we recommend CAMACHINE 10-6, which runs up to 1500 F.P.M. on paper or 650 F.P.M. on board. The slitters on CAMACHINE 10-6 can be spaced to widths from ½" up. Rolls can be rewound in diameters up to 30".

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CAMERON MACHINE COMPANY 61 POPLAR ST. BROOKLYN, N.Y.

MIDWEST OFFICE: Harris Trust Building, 111 West Monroe Street, Chicago

trant, and at present an ink prepared by the following formula is used:

Soluble Blue 2B Extra (National Aniline & Chemical Company)	6.00 g.
Hydrochloric acid, conc.	6.00 ml.
Distilled water, 120 Fahr.	250.00 ml.
Cool to 70 Fahr., and add distilled water to make up to	950 ml.
Analysis	
Total Acidity, as HC 1, determined by electrometric titration	0.3%
Transmission at 430 $m\mu$ determined at 100-1 dilution in a 1 cm. cell	81.0%

While it has not yet been shown that this ink is the most desirable penetrant with respect to *p*H, colloidal properties, etc., it does afford a standard penetrant free from the uncontrollable variables of ink from commercial sources.

Salvage and Conservation of Materials

A. BOYD ZOOK, Senior Indus. Specialist Industrial Salvage Branch, Salvage Div. War Production Board, New York, N. Y.

Waste is typical of the United States. Having plenty of new material we never have considered what we discard as of any importance. Scrap metal, in the average plant, has been something to dispose of as quickly as possible so as not to interfere with operations. It may have some little value, but that hasn't been important. Obsolete equipment, in the average factory, has been something to store in an unused shed or a vacant yard to gather rust. The same is true of our homes and our farms. The old automobile and the broken vacuum cleaner have been just as useless, in our eyes, as moldy bread or spoiled fruit.

The Industrial Salvage Branch is under the War Production Board and is charged with responsibility of developing salvage programs for waste materials, including iron and steel scrap, nonferrous metals, rubber, manila rope, burlap, and commercial solvents wherever they can be found throughout industry. The Industrial Salvage Branch is responsible for expediting a larger, faster flow of production scrap back into the bloodstream of production and obtaining the maximum amount of dormant scrap from all industrial companies in the United States.

Dormant scrap is defined as "obsolete machinery, tools, equipment, dies, jigs, fixtures, etc., which are incapable of current or future use in the war production effort because they are broken, worn out, irreparable, dismantled, or in need of unavailable parts necessary to practical re-employment."

All salvage programs of the Industrial Salvage Branch are designed to acquire first salvagable items of least importance and easiest to obtain; and, second, gradually drop the floor under those items which may be important and more difficult to obtain.

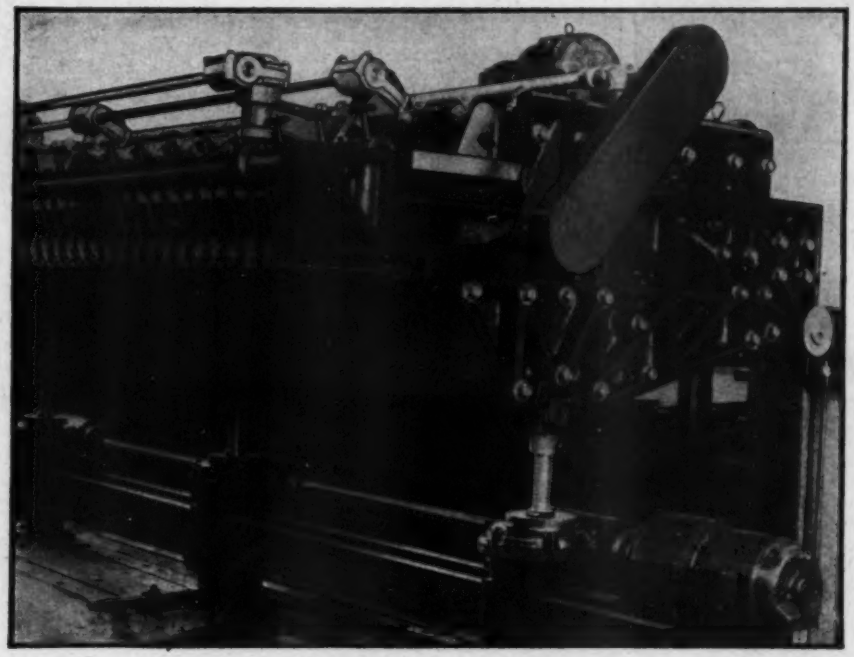
To obtain the enormous tonnages of scrap materials so vitally needed is a complicated problem dependent for solution

● *We offer safe, economical solutions to all pulp and paper mill drainage problems with our twill weave, plain weave, sewed seam, and soldered seam wires.*

INTERNATIONAL WIRE WORKS

MENASHA, WISCONSIN

THIS IS A PRESSURE INLET



To the casual eye, the above cut does not necessarily indicate a high speed Inlet. But examination of the heavy structural design and the totally enclosed construction all point to pressure—HIGH PRESSURE—to synchronize the speed of the stock with the highest wire speed ever run on a paper machine. This necessary pressure is obtained by direct pumping or by use of a specially designed headbox. For high-speed, free and light weight sheets. Available after the War.

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Slices and Head Boxes • Screw Presses • Micro-Mist Spray Dampeners • Laboratory Equipment
Pulp Washing Systems • High-Speed Beaters • Breaker Beaters • Vortex Beaters • Plug Valves
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upon specific plans and methods. For that reason under the War Production Board there are four salvage branches.

The Special Projects Branch is organized to locate and dispose of accumulations of scrap which are involved in technical, legal, or financial problems. Working through a subsidy arrangement with Metals Reserve Corporation and War Materials, Inc., subsidiaries of the R. F. C., this branch is able to obtain, with comparative rapidity, scrap available from abandoned street railway tracks, unused railroad spurs, abandoned bridges, and abandoned buildings.

The General Salvage Branch is obtaining scrap materials of all kinds from households, farms, retail establishments, institutions, and municipal governments. Their basic organization is a state chairman and an executive secretary in each state, responsible for establishing county organizations and incorporating other volunteer groups in the drive to obtain maximum scrap from the general public.

The Scrap Processors Branch has been able to establish a 100 per cent turn-over each 60 days of all obsolete cars in the 18,590 auto-scrap dealers yards. This branch regulates and supervises the scrap dealers which are licensed by the Government and are required to render a monthly report (Form PD 151) of their purchases, sales, and inventory.

The Industrial Salvage Branch is conducting an intensive campaign on the basis of voluntary co-operation with industry—with every industry, every unit of every industry, and with executives of every unit of industry.

The Industrial Salvage Branch will not collect or buy any of these materials. We have no control over scrap prices nor have we anything to do with the allocation of scrap materials.

The Industrial Salvage Branch is only in a position to act as advisor and consultant and a stimulant to industry. Aside from such advice and counsel, business must do the work—for us, for itself, and for our country.

Look into your products and you will find old designs which have long ago been superseded but held on your records just in case you get a rare order for one.

Trace the pipelines in your plant and you will find enough idle valves and fittings to meet your needs for a long time to come, granting that the plant has been in existence for an average period of time and that it has followed average practice. Take down what you do not need and scrap it. We must naturally impress industry to keep certain waste materials separated and clean—in other words, practice proper segregation of metals and materials. This also enables the speed-up usage of these materials. We realize that every business presents a different problem.

Scrap from sources such as home and automobile graveyards may eventually dry up; this means that industry must produce the large percentage of scrap.

It is necessary to have scrap metal and steel to operate our open-hearth steel furnaces. To make two tons of steel, approximately one ton of iron and steel scrap

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The Third War Loan must have your wholehearted support. Every surplus dollar should be invested in Bonds. The manufacture of Tanks, Planes, Ships, Guns, Bombs, Ammunition and Supplies must go on and on . . . and be increased. A shortage of this or that will mean the loss of more and more lives.

Bond purchasing is a sound business venture. The wealth of your Nation makes them safe. The freedom your dollars will help win will be beyond any dollar value that could be mentioned.

The Third War Loan is being enthusiastically backed by citizens from all walks of life. Industrialists welcome this safe source of investment for their unused capital and profits. We are all in this drive for victory—and we must win!

Our boys are giving their lives. They are enduring sweltering heat, muck, dust, rain and cold. They are not whimpering. They are expecting us to provide them with the implements of war. We must back their attack with our dollars and help them blast a path to Victory. Buy bonds today!

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Look at the INSIDE STRANDS when you buy PACKING

Ordinary packings are merely dipped in lubricant after braiding, plaiting or twisting. The result . . . such packings soon lose their lubricating quality, dry out, and score the rod, shaft or stem.

Not so with PALMETTO and the other G-T Self-Lubricating Packings. *Each individual strand* of these packings is separately impregnated by a special lubricant, while hot and under pressure, before braiding, plaiting or twisting.

G-T Packings, therefore, come to you literally *saturated* with lubricant. That's why these packings remain soft and pliable for long periods . . . protect shafts, rods and stems . . . reduce annual packing expenditures and stuffing box maintenance costs. You are SAFE when you buy G-T Packings, and there's an exactly suitable style for every fluid.

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For rods and shafts; layer over layer construction insures uniformly even bearing surfaces.

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SELF-LUBRICATING
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PERKINS
No CALENDER can be better
than the *ROLLS* in it
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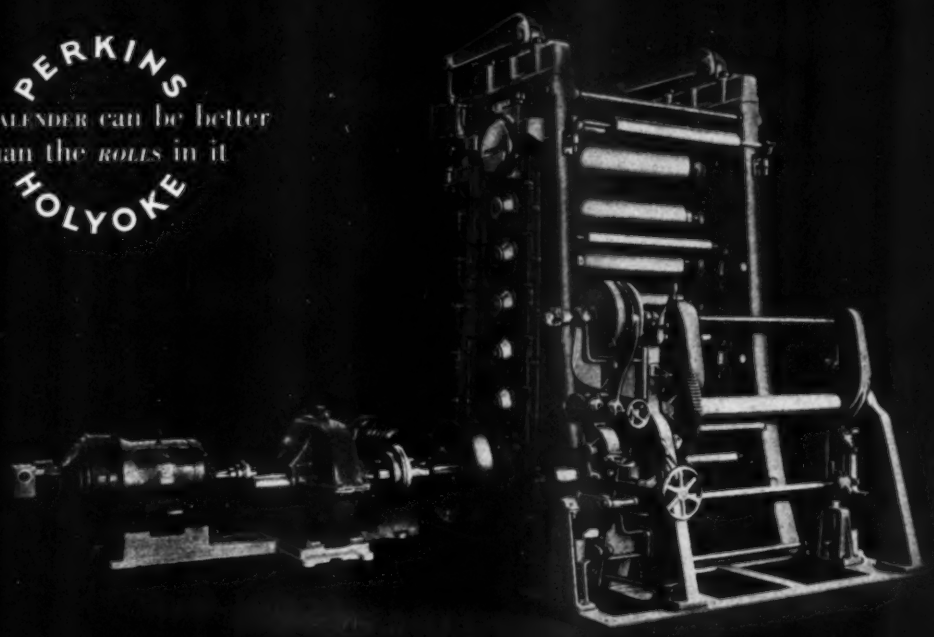

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HOLYOKE, MASS., U.S.A.
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

"Supervised for Your Satisfaction"

this FITCHBURG "TRIUNE" Cotton Dryer Felt

is doing a great job of drying paper

Made of the finest cotton, carefully checked all through the spinning, twisting, weaving and final inspection

5 distinct weaves — For every paper
Prestretched and preshrunk if you desire

General Sales Agents

Morey Paper Mill Supply Co., 309 South St., Fitchburg, Mass.

is used. By adding this proportion of scrap to the furnace charge, steel is produced more quickly and economically.

And, insofar as aluminum ingot is concerned, one-fifth is clean aluminum scrap. Moreover for every 100 pounds of copper consumed in the United States in 1942, eight pounds was provided by copper scrap.

The speed with which we win this war is in almost direct proportion to our ability to produce the war armament upon which our Victory depends—and one-half of war armament is produced from secondary, waste, or scrap materials.

A number of the papers presented at the annual convention of **The American Pulp and Paper Mill Superintendents Association,** held in New York City, June 15-17, 1943, have been abridged and are being published in this section. This is the third installment.

The Importance of a Recovery Unit as Steam Generating Equipment in the Pulp Mill

F. H. ROSENCRANTS, Vice President
Combustion Engineering Company, Inc.

The following presentation may be considered supplemental to a paper under the subject "Modern Recovery Unit for the Sulphate Process" presented at the annual meeting of the Technical Association of the Pulp and Paper Industry, February 17-20, 1941. This paper was written following three years' operating experience of an original development unit at the Canton plant of Champion Paper and Fibre Company and a year's operation of the 250-ton capacity unit at the West Point, Virginia, plant of the Chesapeake Corporation. The Chesapeake unit was substantially identical to the Canton unit except that water cooling of the furnace was extended to make it a 100 per cent job. A third drum located at the top of the unit was added as a means of eliminating horizontal runs of tubing on which chemical could lodge and build up and the return bends of the superheater were carried above the roof baffle for the same reason; a steam air heater was substituted for the gas air heater; the baffles were made almost entirely of metal instead of tile; and greater accessibility and facilities for keeping the heating surfaces free of slag accumulations were incorporated. These were the major changes. Minor refinements were also incorporated.

All units subsequent to the Chesapeake unit have been identical in design with it except as affected by such factors as capacity, steam pressure, and steam temperature. There may have been some small improvements in detail, the desirability of which was dictated by experience, but such have been the only changes.

The operating record of the Chesapeake unit is of particular interest for the following reasons:

1) It is the first fully developed unit of its type, hence the record covers a greater duration of time than applies to any other unit of the same design.

2) Mill operation is continuous through week ends and also holidays, other than the 4th of July and Christmas.

3) The liquor handling capacity required by the mill being in excess of the capacity of this unit, it is always run at its full capacity.

4) The state of cleanliness and the state of well-being which pervades the general vicinity of the recovery room creates a feeling of confidence that the unit is being well operated and maintained, hence any operating and maintenance figures quoted as applying to this unit may be presumed to represent normal results with good operation.

The unit has been on the line 96.5 per cent of the total elapsed hours from the initial fire up to December 31, 1942. The average steam output has been at a rate 2 per cent in excess of the rate anticipated at the time of installation.

Steam production is of secondary economic importance in the operation of a recovery unit. Chemical recovery is the pri-

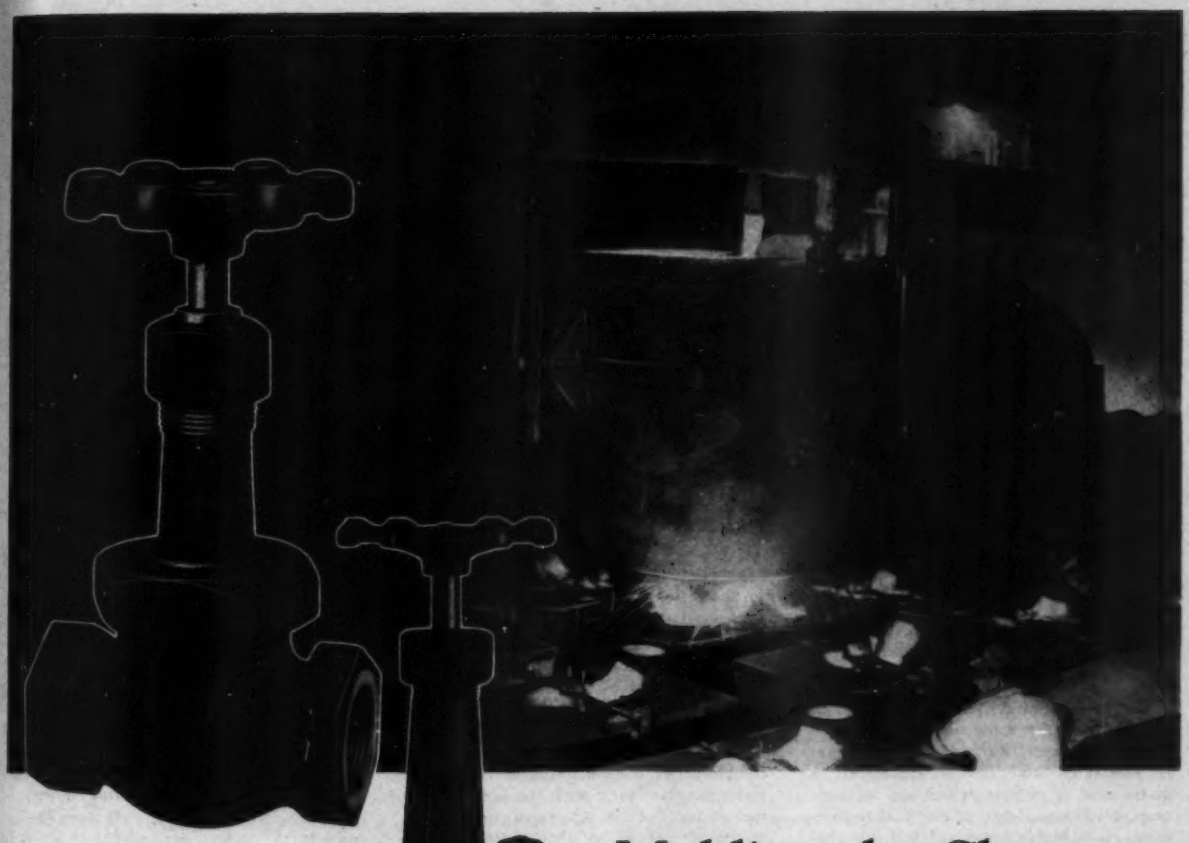

Fig. 171

Fig. 1462

Molding the Character of a POWELL Valve

Development from "design" to "duty"—that's a critical stage in the life of a valve. In our foundries, Powell Valves, whether of bronze, iron, steel, pure metal, or special alloy, take on the form and substance that Powell Engineering has pre-determined will best fit them to perform the duties for which they are destined. Here under the watchful care of experts are molded the character-istics that have earned for Powell Valves the designation "Standard for Control." That's why today many industrial leaders are turning to Powell for the solution of all their valve control problems.

Fig. 171—A 150-pound screwed end all Iron "Irenew" Globe Valve with union bonnet and regrindable, renewable iron plug type disc. Steel stem. Made in sizes ¼" to 2", inclusive.

Fig. 1462—An all Iron "Master Pilot" Gate Valve with screwed ends, rising stem, bolted flanged bonnet and taper wedge solid disc. Made in sizes ¼" to 2", inclusive, for 150 pounds W. P.; 2½" to 4", inclusive, for 125 pounds W. P.

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Dependable Valves Since 1846

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QUALITY and SERVICE
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Because
WE ARE GEAR SPECIALISTS . . . WE CAN SERVE YOU BETTER
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mary objective. On a dollars and cents basis, the chemical recovered is worth several times the value of the steam produced. However, the value of the steam is substantial and having established a given rate of supply which is, in most cases, a substantial part of the total requirements, it is highly important that this supply be dependable, uniform, and not susceptible to interruption or to wide variations in flow.

A large part of recovery unit operating troubles arise from inability to handle the water supplied to it with the liquor either on account of an abnormal amount of water or due to an abnormally low gas temperature to the cascade operator. Hence a margin of multiple-effect evaporating capacity overlapped by a margin of gas temperature to the cascade evaporator is desirable—even at some sacrifice in the quantity of steam generated.

Plugging of the gas passages is the greatest cause of erratic variation of steam flow and to interruption to service.

Cleanliness of the heat absorbing surfaces is a matter of both design and of operation. It is not possible to design a unit which will not get fouled up with an accumulation of chemical. It is, however, possible to so design the unit that it may be kept clean and continually operative with a close approach to uniform steam output over indefinite periods of time. Such of the principal requirements are:

1) Vertical tubes spaced on wide centers. This is essential in the high temperature zones as applying to both the boiler and the superheater. It is desirable even in the rear passes.

2) A free fall of material dislodged from heating surfaces in the high temperature zones direct into the furnace. The further this principle can be carried into the low temperature passes the better.

3) Continuous removal of deposited material from pockets formed by the baffling arrangements in the rear passes. If allowed to accumulate, infiltration of moist air results in the deposited material settling up into a hard mass which becomes non-removable without shutting down.

4) Provision of the closest possible approach to perfect accessibility for hand

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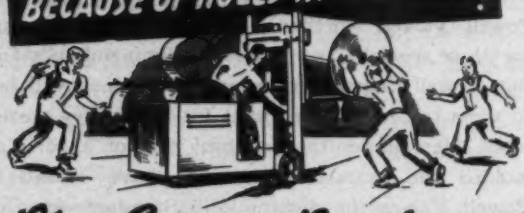
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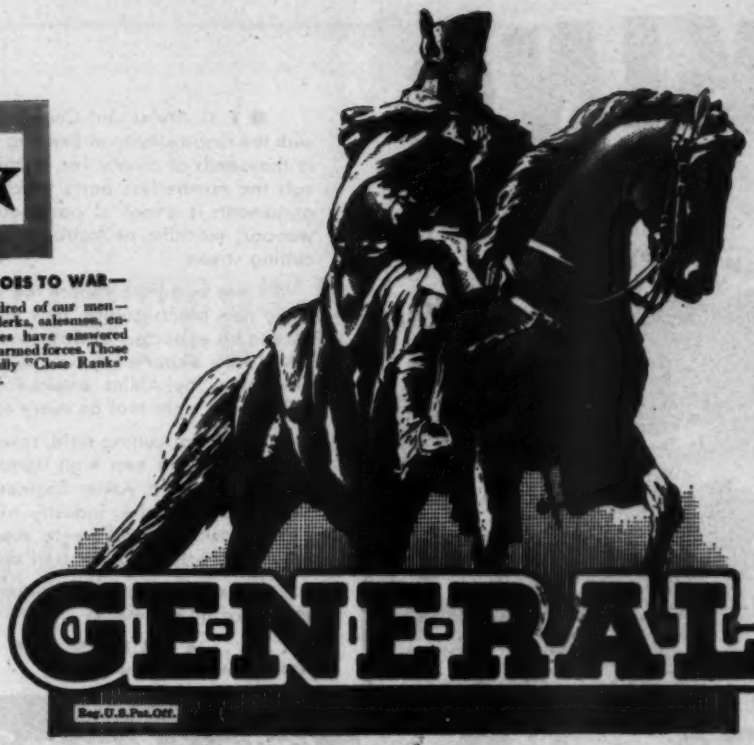

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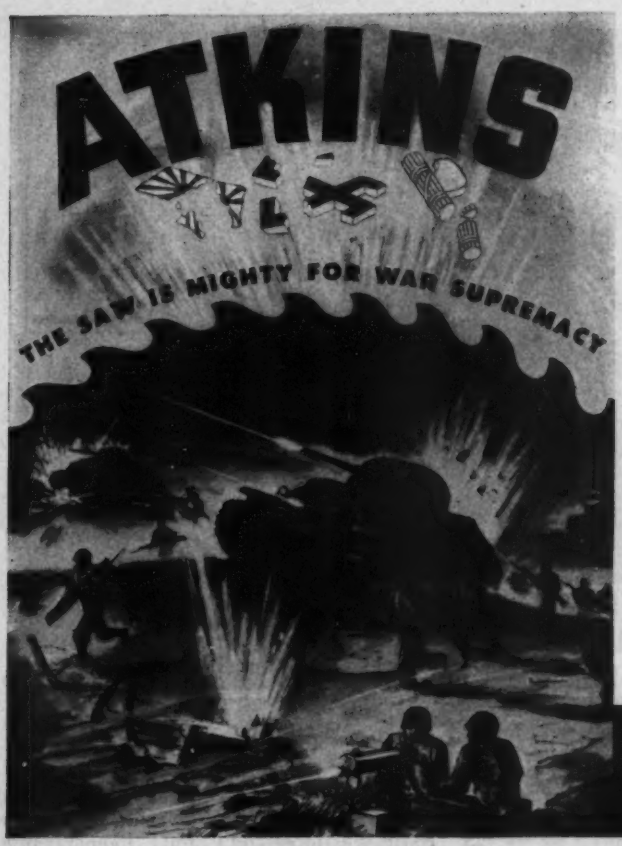

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lancing every square foot of heat-absorbing surface in the high temperature zone. Plenty of generously designed lancing floors and a profusion of ports designed to be easily opened with the end of the hand lance and so that they close tightly when the lance is withdrawn are essential. Compressed air is recommended for lancing in preference to steam.

5) Adequate steam blowers for the surface in the passes operating at a temperature below 1,000 to 1,200 Fahr.

6) Metallic baffles in preference to tile so designed and secured in place that they can not be damaged by the lancing operation are highly desirable.

7) Avoidance of the use of air preheater in the gas stream. The close spacing of tubes is bad. If the tubes are horizontal they are worse. The situation is aggravated by moisture precipitation. When starting up and shutting down the unit and during some abnormal operating conditions the gas temperature in contact with the surface gets below the dew point—moisture precipitates and reacts with the deposited chemical to form an adhering solid which very nearly defies removal. This condition is aggravated in cold climates. A liberal application of soot blowers generously operated may afford a measure of relief but an air heater will always be a potential source of trouble from a cleaning point of view.

8) To a lesser extent than air heaters, economizers should also be avoided. Economizer design is normally associated with closely spaced horizontal tubes, a bad condition from a cleaning point of view. A vertical tube economizer arranged integrally with the boiler would be a preferable arrangement. So long as the incoming water to the economizer is kept at a temperature well above 200 Fahr., a little trouble from moisture precipitation will be encountered; but this is not always possible.

9) To the utmost possible degree avoid all projections, ledges or any feature contributing to the deposit and adherence of solid matter on the heating surface, baffles or walls.

Having gone the limit in the design to reduce the rate of deposit and to provide facilities for cleaning, ultimate success then depends on a routine of continuous and persistent cleaning. The trick is in not letting the unit get dirty. In its early stages of accumulation the deposits are easily removed. After a certain point of progress in the process of accumulation the surface of the deposited material fuses and solidifies. Bridging from tube to tube takes place and masses of fused slag become anchored. The job of removing then becomes a real task. The critical points of chemical deposit are soon established and with a limited time it becomes possible to establish a routine of lancing and soot blowing to keep the unit clean; i.e., from getting dirty.

Maintenance of the Chesapeake unit has been restricted to a single major item—renewal of refractory to the furnace floor. This has required attention about every nine months. To effect the necessary repair requires a time out of about 30 hr.

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from shutdown to starting up and for the most part has been carried out at scheduled holiday shutdowns. The cost per 1,000-lb. steam provided reduces to approximately 0.38 cents (about 3.8 cents per ton of pulp). The sum total of minor items of maintenance has been negligible. It may be safely stated that total maintenance is below 0.50 cents per 1,000 lb. steam (less than 5 cents per ton pulp).

Maintenance of Steam Heater Sections

W. K. METCALFE
J. O. Ross Engineering Corp.

The heater situation as of this date is bad. It is very difficult to obtain heater surface and even after it is obtained, it is not worth much. As far as the paper mills are concerned, unless there is some very special application, it is only possible to obtain steel tube heaters to replace the former copper heater sections. These heaters are manufactured with the same machines and along the same designs as the former copper sections. The tubes range in thickness from .025 in. to .048 in., the majority of the available sections being .035 in. thickness.

The heaters have about the same heat transfer rate as the former sections and very few of them have less than 20 per cent reduction in heat transfer over the former copper heating surface.

Some paper mills have asked why the manufacturers do not go back to the old style pipe heater, or cast iron type heater. The real reason that these old former types are not available today is that the new type heater, due to its performance, has made these two types obsolete, and the War Production Board will not let them re-tool in order to manufacture this type of heater.

The war type thin walled heater has not been in operation long enough to determine the actual average life of the section. Indications are, from actual installations, that in a good many mills these heaters will not stand up more than three to six months.

Development work on steel type heaters is advancing, and from preliminary tests it appears that one of the best type of heaters available after the war will be a steel pipe heater with an inner pipe combining a non-freeze feature, and tapered fin extended surface. This type of heater is being manufactured, but is now allocated to special war jobs and is not available for paper mills. After the war, however, we presume it will be available to all types of users.

In the meantime, the mills should do everything possible to take care of the heaters they now have. The two most common troubles encountered in the mills are corrosion and freezing.

Corrosion is usually caused by poor quality steam. Correction of this condition involves one of several boiler water treatments to counteract the corrosive elements in the steam. Another cause of corrosion is non-condensable gases in the steam, and this condition can usually be coped with by means of the proper venting in the piping systems. If the system is a so-called high pressure system above 20 lb. gauge, this takes the form of a petcock, which is cracked so that there is constant leak, or better still, the core of the petcock is removed, and with a three-cornered file a groove is cut completely around the core so that the petcock cannot be shut off.

For low pressure systems, manufacturers usually recommend thermostatic traps. When a heater tube is attacked by corrosion, the first sign of trouble is usually small pin holes through the heater tube wall. Corrosion takes place more readily in a section of the tube where the condensate collects. For this reason, it is advisable to install a heater with the tubes vertical.

Freezing is, in the majority of cases, caused by air bound heater sections. If the suggestions given regarding venting, as covered in this paper, are followed, this factor can be eliminated. Freezing is also due to two other very common causes—both depending considerably on the operator. The first is quite often improper procedure during a shutdown. Most steam coils will not freeze as long as there is steam pressure on the heater section. However, during a shutdown, when the factory shifts from back pressure to live steam, there is an interval when there is a chance for freezing unless the operator is very careful.

The second cause for freezing is throttling action into the heater section. For

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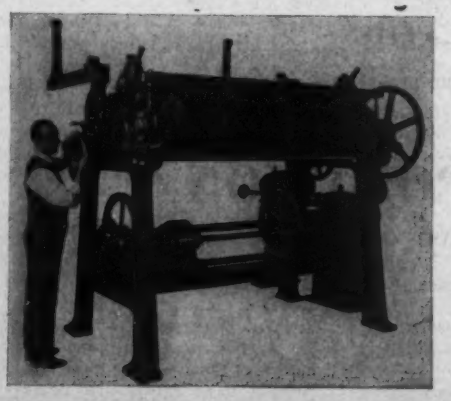

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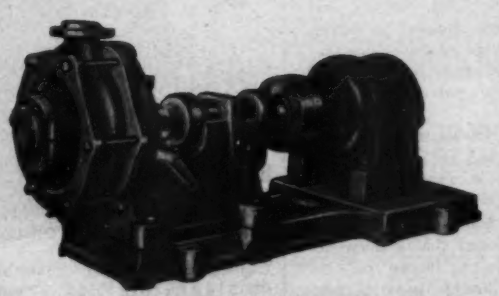

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Duriron equipment is not affected by most corrosive liquids, strong or weak, nor by gritty, abrasive solutions. Maintenance is exceptionally low—you can count on Duriron equipment being always on the job. Consider especially equipment made of Durichlor for handling hypochlorite bleach and equipment made of Duriron for alum solutions.

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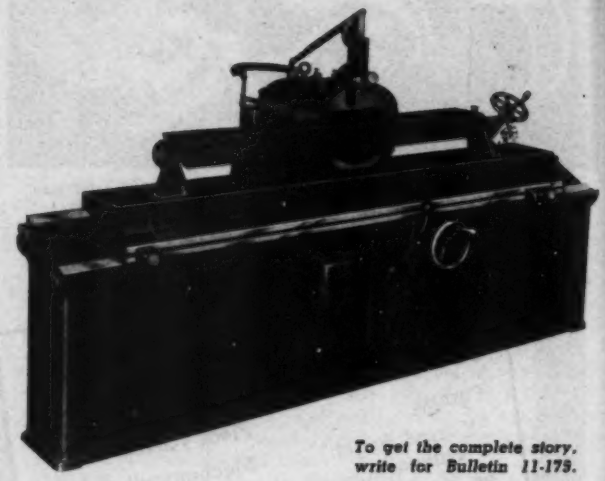

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this reason, most paper mill installations are designed with a minimum number of valves in the piping layout. Every valve offers another opportunity for the operator to throttle the steam into the heater coil. Steam should be permitted to flow freely through the piping system at all times during cold weather, and it is important to be sure that the regulating valve to your heater is of the on-off type. If the first heater section on the air inlet side is arranged to run wild so that the temperature reaching the controlled heater sections is not below the freezing temperature, a throttling type valve may be used.

One simple way of insuring the heaters from a freeze-up is to install a thermostatic switch in the air inlet set for say 40 Fahr., which automatically opens a valve on the first heater bank. This will heat the incoming air to a temperature above freezing. Another way is to install a Mercoid switch in the condensate line wired through the supply fan motor, to stop the fan in case the condensate temperature drops to 40 Fahr. With the fan down, the velocity of air through the heater ceases, or, at the most, is so slight that the heaters will not be damaged.

When a tube freezes, the tube splits usually at the seam. This split usually occurs a short distance from the condensate end of the tube.

Piping systems for your heater bank installations are important enough to be considered separately.

The pre-war copper type fin or extended tube heater requires rather fussy piping systems. What was true then is even more true with the war type heater.

It is very important to follow the manufacturers' recommendations when an installation is being made. Points in particular to remember are:

1) Tap off the top of the main supply header with your connection to the heaters.

2) Properly drain the steam supply lines. This means that the pipe should be full size to, and including the elbow at the end of the supply line.

3) Install minimum number of valves in the piping system, and if there is a control valve unprotected by a preheater, be sure that the control valve is of the "on/off" type.

4) Install a good make standard type bucket or float trap and be sure that the design is such that if anything should happen to the bucket or the float, the most that can happen is that the steam passes on through the trap and that condensate does not back up into the heater coil.

5) Each bank of heaters in a battery should have an individual trap. The condensate rate becomes less as the air becomes heated, and if the heater banks are tied into a common trap, the differential in pressure between the banks will often cause trouble.

6) Be sure the system is properly vented; either with thermostatic valve on a low pressure system, or a petcock, preferably grooved, on a high pressure system.

7) Do not cut the pipe sizes of the manufacturers' recommendations. Too often the mills take it on their own hands to

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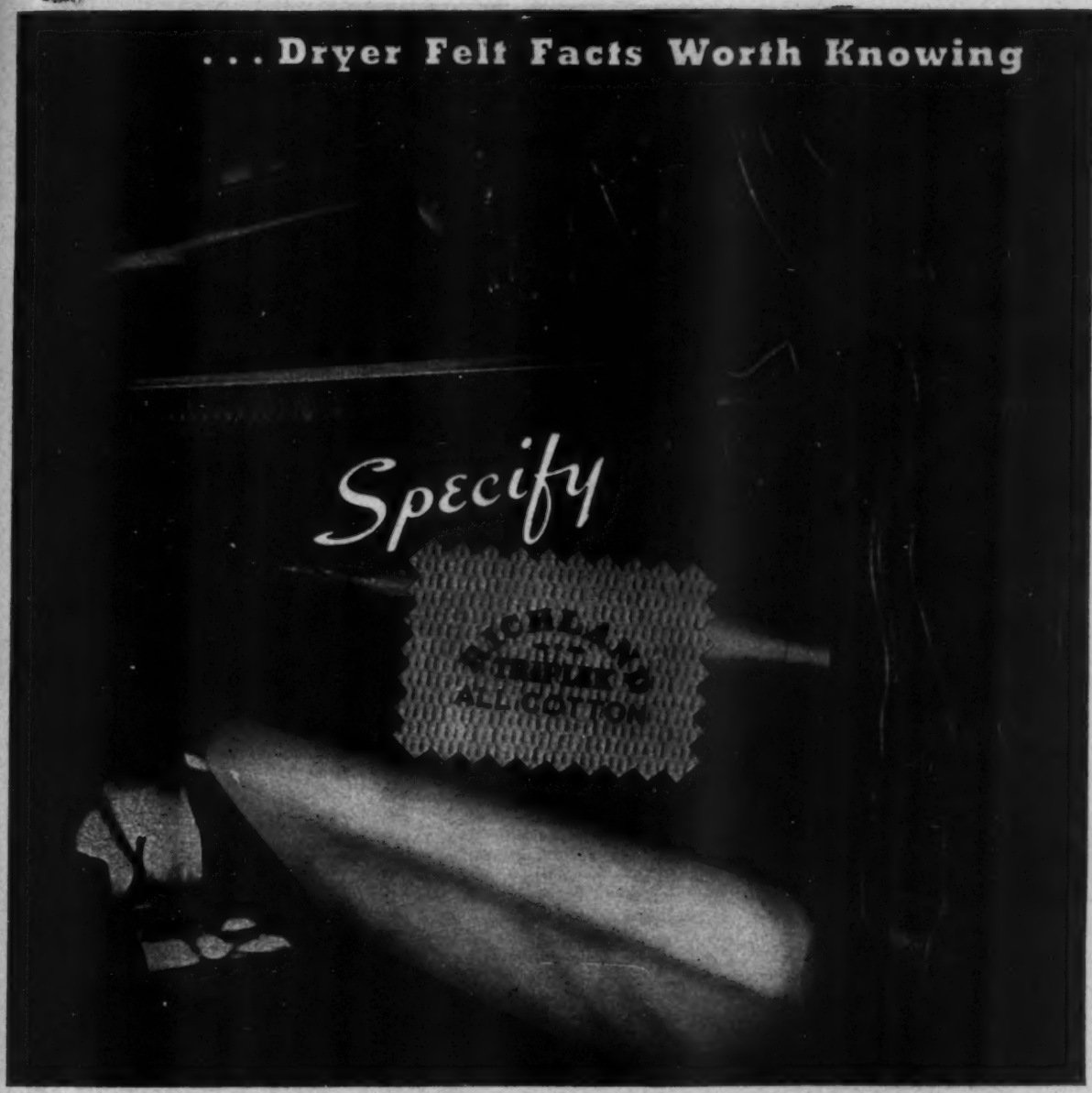

HERE are facts about RICHLAND TRIPLEX All Cotton Dryer Felts which you should know. They are made from carefully selected tough cotton fibre. Laboratory control of their production insures evenness of yarns . . . uniformity of weave. Their smooth contact surfaces contribute to the making of fine qualities of paper. Shrinkage and stretch in RICHLAND TRIPLEX felts have been reduced to a minimum. Their high degree of porosity is responsible for low steam consumption. These are RICHLAND TRIPLEX All Cotton Dryer Felts features, which influence paper-men to specify them over and over again.

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establish the sizes for the supply and return lines and run into difficulties.

8) Be sure that the condensate lines are not installed where the temperature gets below freezing. Insulation on the lines usually works satisfactorily. However, where possible, it is recommended that the lines always be installed on the warm side of the air system or in room air conditions.

9) Set up a schedule for inspection and checking over the piping system at regular intervals, or have the suppliers' representative check over the system when he stops at the mill.

Phenolic Materials Meet Wartime Demand of Paper Industry

FRANK W. VOGT
Joseph T. Ryerson & Son, Inc.

In these war times when so many metals are being replaced by plastics it is natural that the phenolic laminated materials would be called upon by industry to an increasing extetnt. Many industries besides the paper mills and steel mills are turning to this material for use as a bearing. The paper and steel mill experience extending over more than a dozen years has served as a guide in making new applications, many of which have worked out so successfully that the water lubricated type bearing will no doubt be used in these places permanently.

There are many ways of manufacturing this type bearing material. Fundamentally they are similar in that sheets of canvas, belting or other fabrics are impregnated with resin and molded under heat and pressure. The better wearing properties of some of these have brought in general use the heavy belting type fabric especially for such heavy duty bearings as on calenders, press rolls, beaters, etc. Lower friction and longer life go hand in hand so that a two-fold advantage is gained through the use of this high quality product.

Generally the installation of these phenolic bearings consists of using a liner ⅜ in. or ½ in. thick in much the same way as bronze was previously used. Babbitt bearings are replaced by simply boring out the old holders or housings and inserting the completely machined liners and fastening them in place.

The design of the bearing itself and the arrangement of the water lubrication supply are important considerations in obtaining the best bearing performance.

Suction box covers made of flat laminated slabs of Ryertex are being found to have many advantages in these days of critical materials. Worth while savings can be effected on one of the tightest materials used by the paper mills today; namely, fourdrinier wires. Increased wire life of 10 per cent to 150 per cent when translated into pounds of conserved high quality bronze wire becomes a very important consideration.

Doctor blades, now long in use on press rolls, etc., are continuing to be used to advantage in the industry. Some mills are doing a good job with them on creping

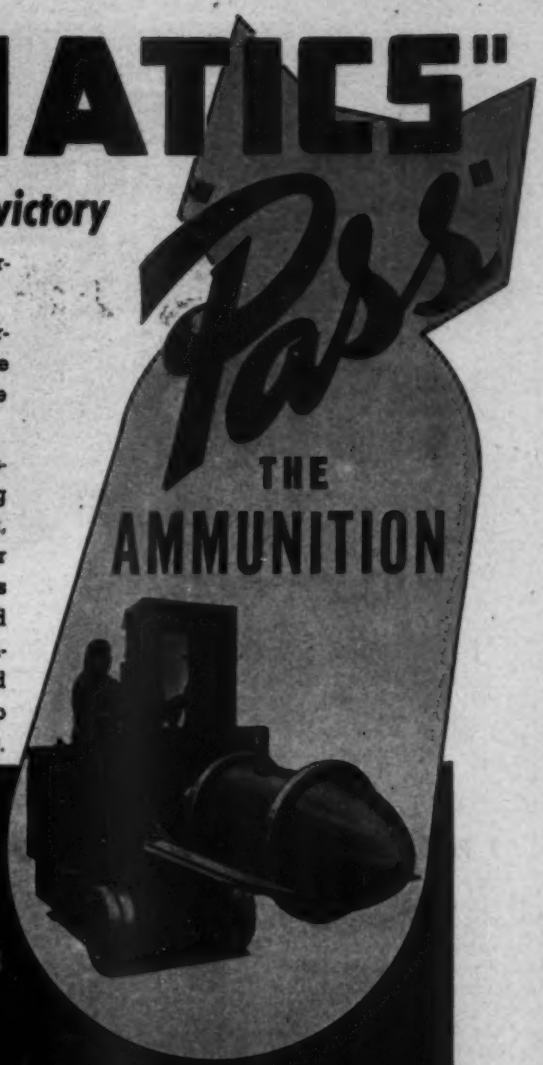
"AUTOMATICS"

All of us are working for a quick victory

★ You in your way—we in ours—are extending ourselves to the limit to shorten the road to victory.

It is obvious that materials handling is a most important part of the war effort and to us is assigned the task of getting materials handling equipment to those places where it will do the most good.

Naturally we regret the situation that makes it necessary for so many of our customers of long standing to be denied new "AUTOMATICS" for the present. Yet, all of us are happy to cooperate in our own way for in this united action comes victory. One of these days there will come an end to the "for the duration" period and "AUTOMATICS" will again be available. Meanwhile, since we are "all out for war production" and your victory efforts too are being contributed—keep your "AUTOMATICS" going to keep materials flowing.



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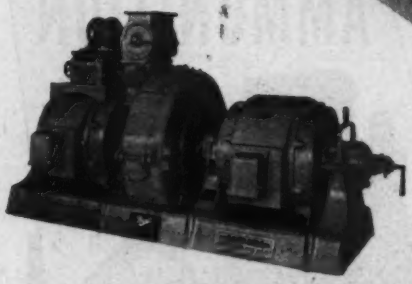

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THE BAUER BROS. CO., SPRINGFIELD, OHIO

doctors, others on felts and some on calenders. Improvements in material have assisted greatly in making some of these installations particularly successful.

Some mills have water conditions which cause a certain amount of corrosive action to take place on roll journals in addition to many other metal parts. When Ryertex bearings are used under such conditions much of the etching or pitting effect of the water is prevented by applying a small amount of grease in addition to the water. This is usually possible on such important bearings as bottom calender rolls and press rolls, which in most mills are simply lubricated with water only.

In further reference to water conditions it will be of interest to many to know that it is possible to obtain bearings that contain finely divided particles of mineral polishing agents. These are thoroughly and evenly distributed in the body of the fabric of the bearing so that they are in contact with the journal during the entire life of the bearing. The effect of this type material is to polish or constantly overcome any etching effect of the corrosive water. The result is that the bearing lasts longer and has a lower coefficient of friction.

Another interesting observation in connection with the effect of different kinds of mill water is that slime accumulation does not adhere to Ryertex like it does to brass. This has been very noticeable on cylinder rods and screen plates. Cylinder rods are not affected by corrosive mill water and do not pick up the slime which causes many board mill cylinders to get out of balance. Screen plates with small drilled holes are being found very easy to clean with a stream of water such as is ordinarily used in washing down the machines.

Bearings operating in wet places or where water can conveniently be used instead of grease or oil are the ones where the Ryertex type material will out perform metallic bearings. In such places bearing life has been increased as much as ten times. This makes a big difference on presses and calenders where keeping rolls in line is important from an operating point of view.

Cleanliness is enhanced through the elimination of oil and grease on bearings which are normally hard to keep properly lubricated. The ability of Ryertex to operate here on water only simplifies this problem as well as that of keeping dirt and grease out of the paper stock itself.

Power Plant Operation and Maintenance

G. HAROLD SUHS, Chief Engineer
The Sorg Paper Company

With our pulp and paper mills operating 24 hrs. per day and six or seven days per week, time for inspection is not readily available. It is unfortunate but true that the paper machines can go down at regular intervals for wash-up, wire change or felt change, but if an effort is made by the power end to get a shutdown for inspection of its equipment, there is an immediate disturbance at the head office that can be heard the length and breadth of the land! In all too many cases the management feels that by some mysterious inner sense, the power man should be able to determine, without actual inspection, just

P. A. PAULSON, Consulting Engineer
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Potter's Patent—Every Hook Guaranteed
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Naugatuck, Conn.
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They are available in the "S" and "XLS" ball bearing series, the former starting at ½-in. bore and the latter at 1⅜-in. bore, the complete range running up to 21-in. bore and 28-in. O. D. And there is the "RXLS" series extra light roller bearings, paralleling the "XLS" in size range.

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Write for the Catalog, which describes 108 distinct series of PRECISION Bearings, embracing over 3,000 catalogued sizes.

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Despite all handicaps, American mills are credited with a fine production job on paper and "board," and Orr is proud to have had a part in that accomplishment.

At no time has Orr felt quality varied from the high peace time standard. At no time have felt shipments lagged behind the demand.

Orrs are available for every mill requirement—every grade or machine speed. Orr engineers are also available for study of special needs.

when some equipment will fail, and then, by more mysterious means, prevent the failure!

It is today very much the job of the power man to sell the management on the need for regular inspection. The insurance underwriters and the state inspectors will prove of valuable aid on this. In some cases they have taken the issue in hand and insisted on proper inspection on penalty of insurance cancellation.

The inspection report and analysis is the basis of any maintenance program. In case of progressive failure, the probable ultimate life can be estimated and repairs made before actual failure causing serious lost time.

It might be well to mention at this point that in the prewar period, many alert organizations insured themselves, in part, against lost production due to equipment failure by carrying "use and occupancy insurance" on such vital units as main turbines, generators and boilers. Such insurance is of doubtful value during war conditions. Replacement parts and special labor simply are not available, and it is very questionable if the insurance companies could be held liable for time lost because of the impact of the war program on such matters.

The sensible and patriotic program is to inspect and repair—not operate to destruction.

There is little need to impress on any good operator that the heavy overloading of equipment for extended periods will materially shorten its life. This holds on boilers, generators, motors, transformers, and power lines.

Every power plant has certain characteristics, bad conditions, limitations, and faults. The repair and maintenance program must meet certain conditions. There is no grand generalization on either an operating or repair program that can present much of value that the normally alert and progressive operator does not appreciate.

Our present power plant was completed in 1928 and it was very modern for the times. It contains three boilers with partial water walls, economizers and air heater. Firing equipment is powdered coal. Steam conditions are 400 lb. at 750 deg. temperature. Two 6250 KVA extraction turbo generators furnish process steam and power.

Initial design assumed 35,000 lb. steam per hour as normal load per boiler with a peak capacity of 50,000 lb. per hour. The total yearly coal consumption was to be 25,000 tons of coal and production of paper about 30,000 tons. In 1938 we burned 39,000 tons of coal and made 40,000 tons of paper. In 1941 we burned 55,500 tons of coal and made 64,000 tons of paper. During this period the boilers were normally operated at 60,000 to 70,000 lb. steam per hour and carried peak loads of 80,000 lb. per hour, and 80,000 lb. steam per hour from a 560 hp. boiler *is a good rating.*

This increase in capacity was not secured without encountering many difficulties which necessarily had to be eliminated to permit good operation.

The first major trouble was excessive furnace slagging due to higher temperatures from operating at higher ratings. When these units were installed, powdered coal firing was in its infancy and one school of thought held that a "cold" furnace would kill or retard ignition. The water wall blocks in these furnaces were refractory faced to assist combustion and remove any hazard as regarded ignition.

At high operating rates the slag would adhere to these blocks and retard heat conduction to the water wall tubes and, as a direct consequence, tend to increase furnace temperatures which in turn caused more slag formation. At times the slag on sidewalls built up to 10 and 12 inches thick and when a boiler was taken off the line, huge slabs of the slag of this thickness and 8 or 10 feet square dropped on edge to the furnace bottom. It is an excellent attest to the soundness of the furnace design that the furnace bottom tubes took this punishment without any failure. This build-up would occur in about two weeks time.

The trouble was partly corrected by replacing the refractory faced blocks with bare blocks. However, the furnace volume is too small for good operation at the high rating without a shutdown at least once in three weeks.

In 1940 additional trouble showed up in the superheater and tubes began to burn out with disgusting regularity. We did not feel secure for even one week. A careful survey, made with the assistance of our insurance underwriters, indicated the tubes

Laminated PAPERS AND BOARD

Men who know, suggest that laminations will be foremost in post-war developments.

Hudson Sharp has pioneered in building the best of laminating machines for foils, papers, boards and other cellulose products used in packaging and shipping.

Today we are building weapons to beat the Axis. Tomorrow we will again be able to build you machines to beat your paper converting problems.

Ask us about some of the new developments in machines for your post-war production problems.

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Liquids are practically incompressible, therefore the slightest tension variation in the unwinding web is instantly and accurately transmitted to the Auto-Hydraulic Brake causing more or less braking on the mill roll shaft to maintain the tension uniform. Send for bulletin.

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No. 180 Series Stickle Traps, in four sizes, for medium and high pressure, designed for economical straight-in-line installation. Ask for Bulletin No. 115.

Stickle A E Series Traps, built for working pressure up to 200 pounds. Seven sizes. Ask for Bulletin No. 35. Stickle Series T Traps for low pressure operations and vacuum service. Ask for Bulletin No. 415.

1. **DEPENDABLE SERVICE** — Stickle obviates most "Steam Trap troubles" with the natural Stickle Open Float Principle, and stark simplicity of construction. Location of valve in top of trap prevents scale and dirt obstruction.

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The Kalamazoo exclusive method of construction is easily adapted to any shape or size with round or square ends, midfeathers, fins or agitators and tapered bottoms and rounded corners.

Saves in three ways by—lowering investment—reducing maintenance—and stepping up production.

ASK FOR ENGINEERING DATA

Kalamazoo TANK & SILO CO
KALAMAZOO - MICHIGAN

had reached the end of their normal life, as the metal was badly fire checked and burned.

We had no trouble convincing the management of the need of completely renewing all tubes most directly exposed to the hottest furnace gases. They were a bit bewildered, however, at the idea of failures in a new (12 years old) boiler room!

Superheater troubles seemed eliminated for during the high production period of 1941 we operated nearly to full capacity every day at extremely heavy load conditions.

However, we wish to state that we are already proving that these heavy operating loads reduce the life of equipment for in February of this year we began again to have superheater tubes burn out. This is an interval of but three years since renewal. An examination showed metal failure due to overheating. This can be readily understood for an analysis will show that to add 250 Fahr. temperature to 70,000 or 80,000 lb. of steam per hour with a given area of superheater will call for considerably higher metal temperatures than will be required to heat 40,000 or 50,000 lb. per hour. We have attempted to help ourselves to some extent by changing the boiler baffles so as to reduce the superheat about 50 Fahr. Other than that, for the present, we can only inspect and replace tubes—as long as we can get them.

A definite cure would be alloy steel tubes —for we have experimented with them. But they are not now available.

The higher boiler ratings discussed naturally called for more fuel. The original pulverizers lacked capacity with normal fuels available. Grindability is, of course, a major factor in pulverized capacity. We found it necessary to change to premium coals having a grindability of 90 to 100, Hardgrove scale. Our older coals had a grindability of about 50.

The semibituminous or Pocahontas coals have the necessary grindability but reference to the records of National Bituminous Coal Commission for District No. 7 will show that amazingly few of these coals have good ash fusion. Very few show a fusion above 2,500 Fahr. and our furnace temperatures reach 2,950 deg. at top ratings.

This has restricted us to a very few coals and we pay a definite premium—but we maintain full production, which is the real answer.

We also assisted our pulverizer operation materially by rebuilding and increasing the capacity. We added about 20 per cent to the cylindrical drum and increased the number of balls. No trouble has been encountered with the driving mechanism.

Combustion control and pulverizer operation was improved by changing the exhauster fan drive and the feed control. The original drive was steam turbine with throttle, not governor, under control of combustion system. With this control the turbine operation did not synchronize with the other elements, due to lag in arriving at top or bottom speed. Fuel feed was erratic as a result. The turbines were removed and constant speed motors installed and combustion control was connected to operate a damper in the exhauster fan discharge. This has proven very satisfactory.

Many other major and minor changes have been made always with the end in view of maximum continuous production rather than top power plant efficiency.

The difficulties in securing replacements on special articles, such as steel valves, regulators, pump parts, etc., are too well understood to require elaboration. But here again "inspection and repair" extend the life greatly. And maintenance costs will drop.

We will mention as a matter of interest that the maintenance of this plant under the original relatively light load conditions was estimated at $30,000 per year. This figure has averaged $33,000 annually over the past three years which we believe speaks well for a regular inspection and repair program, considering the fact that the load has more than doubled on the same equipment.

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To SPEED-UP your maintenance work, reduce equipment down-time and conserve manpower, use these 3 performance-proved Oakite methods:

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NEW EQUIPMENT AND SUPPLIES

Industrial Thermometer

An industrial thermometer, made in standard temperature ranges within the limits of —40 Fahr. and +750 Fahr., has been introduced by Taylor Instrument Companies, Rochester, N. Y. The thermometer utilizes a one-piece grooved case, designed to reveal the mercury column through a wider angle of vision; a chromium plated bezel, fitted into the case so as to hold glass front against four tension springs (fastened by shakeproof screws); and easy-reading Binoc tubing. Standard scale lengths are 7 in. and 9 in. The thermometer is furnished in many combinations of straight and angle stems, with threaded or union connections.

Hydraulic Elevating Table

Lyon-Raymond Corp., 1253 Madison St., Greene, N. Y., has announced improved designs of its hydraulic elevating table used for transferring materials from one level to another, supporting overhanging work, bringing work to convenient heights for operator, and for operations where easy foot-actuated elevation is advantageous.

The standard model is made in a portable type with two stationary and two swivel casters, with single speed hydraulic foot pump. The table top is 30 in. square,

having a lowered height of 29 in. and an elevated height of 43 in. The table swivels but may be locked in one position. Its load capacity is 2000 lb.

Optional features that can be incorporated in the design are: a floor lock to keep table from moving on its casters; a spring-balanced towing handle; locking device which allows table to be turned and locked each 15 deg. throughout the entire circumference; collapsible retaining bars for table sides to hold work on table; four swivel casters in place of the standard two swivel and two stationary casters; stationary type, i. e.: with feet in place of casters; and a two speed hydraulic foot pump substituted for the single speed pump.

Special tables also can be furnished for different capacities, with different sizes of table top, with different lowered and elevated heights, and with any of the above mentioned features or others.

High Frequency Heating Equipment

The Girdler Corp., Thermax Division, Louisville, Ky., has announced the development of equipment for high frequency heating of numerous materials, including cellulose and paper. Flat electrode plates

cover opposite sides or top and bottom of the mass to be heated. High voltage, high frequency current is passed through the mass from the plates. All coils, tubes, controls, etc., are housed in a compact safety cabinet. Certain models are portable and mounted on casters.

Steam-Jacketed Strainer

Blackmer Pump Co., Grand Rapids, Mich., has announced a pipe line strainer, the bottom and sides of which are enclosed in a steam jacket, for handling highly viscous liquids or liquids that are solid at room temperatures. The jacket is suitable for 125 lb. steam pressure. Steam line connections include two inlet and two outlet ports.

The strainer is made in standard capacities of 20, 50, 100 and 200 gpm for pipe sizes of 1, 2 and 3 inches. The 1-in. and 2-in. (50 gpm) units have threaded-pipe connections. The 2-in. (100 gpm) and 3-in. units have flanged connections. Maximum operating pressure is 50 psi at temperature of 600 Fahr.

CO_2 Fire Extinguisher Valve

A new type of valve, applicable to any carbon dioxide fire extinguisher of the hand type, has been developed by C-O-Two

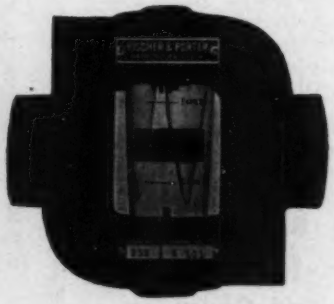
Fire Equipment Co., Newark, N. J. Operated by a lever directly over the carrying handle of the extinguisher, the valve can be opened and closed without setting down the extinguisher. By merely applying pressure to the lever or squeezing it, with one hand, the valve is opened and the gas discharged. On releasing the hand pressure, the valve closes and cuts off the gas discharge.

Sight Flow Indicator

Fischer & Porter Co., 946 County Line Road, Hatboro, Pa., has announced the *Rota-Sight* for flow indication in any application where an approximation of the amount of flow rate is an operating aid and necessity. The indicator shows when a liquid or gas is passing through a line. In addition, it has an indicating float which moves up and down in a Pyrex tube in direct proportion to the amount of flow.

According to the announcement, the indicator is particularly sensitive to low flows. It also states that the float is readily visible even through opaque fluids.

Scale markings may be engraved on the tube for checking one flow rate, or for



holding the flow between a high and low rate. If preferred, an arbitrary reference scale may be provided.

The indicator likewise may be equipped with a visible or audible alarm for protection against dangerously low or high flows. High and low alarm positions are adjustable over the entire flow range of the instrument.

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Triple-chain woven wire cloth, magnified about 32 times.

It is not easy to develop a product which will be used again and again — which is to be *standardized*. It is possibly even more taxing to have to evolve a *special* product — one which must be equally right, but will never be able to prove its case from a world of evidence. The triple-chain weave shown above is just such a specialty. It is comparatively delicate, fragile; calls for engineering with a very fine touch. Distinguished by extreme flexibility, a unique and smooth paper-making surface and good drainage characteristics, it has won a wide, lasting acceptance in the manufacture of certain grades of specialized tissues.

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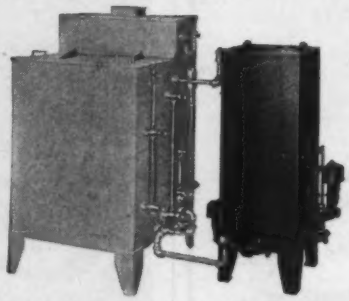
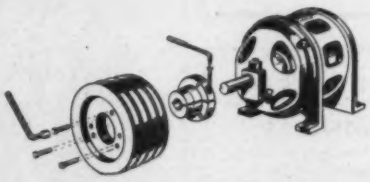
Oil Conditioning Unit

S. F. Bowser & Co., Inc., Fort Wayne 5, Ind., has announced Figure 833 Oil Conditioning Unit for use with Type A Filtration Systems, with receiving or precipitation tanks in oil circulating and filtration systems, or independently for treating high demulsibility oils by means of water washing combined with dehydration and extremely fine filtration. Containing features for washing and dehydrating the oil, the unit augments the operation of the oiling system in use. It is made in three sizes ranging from 30 to 240 gph.



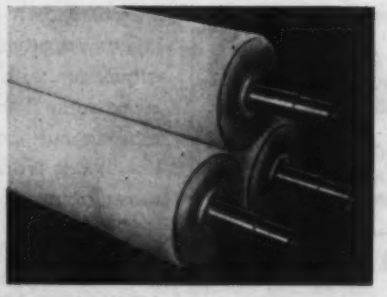
Sheaves for Multiple V-Belt Drives

Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago, has announced a line of sheaves for multiple V-belt drives which have been designed to speed up installation and removal operations. A socket wrench is the only tool needed for either job. The sheaves are available in standardized sizes and are designated as QD.



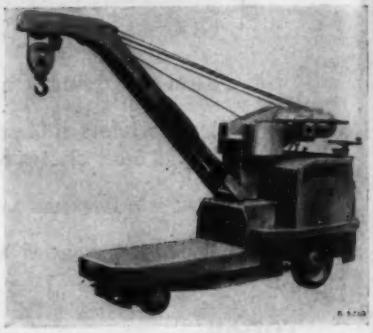
Felt-Covered Wood Rolls

Rodney Hunt Machine Co., Orange, Mass., has announced the development of felt jacketed wood rolls of Shaf-tite construction. The thickness of jacket is determined by the desired cushioning effect; the other dimensions by the size of body on which it is to be mounted. Illustration shows 6 in. diameter rolls on which jackets are about ⅛ in. thick—also metal end plates, provided with many rolls.



Crane Truck

The Yale & Towne Mfg. Co., Philadelphia Division, Philadelphia, Pa., has announced a truck that combines a 6000 lb. low elevating platform truck (Yale Model K23-6C2T) with a 2000 lb. crane (Yale Cable King) into a single unit. With this machine, loads can be picked up, placed on the platform of the truck, into bins, on skids, or spotted where desired. The truck is electrically-powered with four speeds forward and reverse. Separate push button type crane and hoist controls permit simultaneous hoisting and booming of the load.



D-C. Vertical Motor

A direct-current vertical motor, made in sizes ranging from 40 to 200 hp. at 1750 rpm, and in equivalent ratings at other speeds, has been announced by the General Electric Co., Schenectady, N. Y. The motor is furnished for both constant and adjustable speeds. It is of drip-proof protected construction. Provision for the escape of grease reduces the possibility of over-lubrication. A special bearing housing prevents grease from entering the motor and damaging the commutator and the windings.

The cast-iron conduit box can be arranged for bringing in the leads at the top, bottom, or either side. Two handhole covers, removable without the use of tools, permit inspection of the commutator and end brushes. To assure permanent alignment with driven machine, the ring-type base has an accurately machined rabbet and jig-drilled mounting holes. Lifting lugs facilitate installation.

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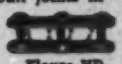
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Flexco HD Belt Fastener

FLEXIBLE STEEL LACING CO.
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FLEXCO HD BELT FASTENERS
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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Volume of the Total Solids in Paper

The author discusses the significance of the volume of the total solids in a paper sheet. This is distinguished from the total volume of the sheet and from the volume occupied by air spaces. This is the "Volligkeitsgrad," and methods for its evaluation are given. It is expressed as the per cent of the total volume of the paper. A sample of paper is gradually and completely submerged under a carefully measured volume of a paraffin oil which is known to have no chemical or physical effect on the paper. The measurement is made in a calibrated pipet so constructed that it can be evacuated after immersion of the sheet in the oil. After a certain period of evacuation, the level of the oil no longer changes. The volume of the oil is read again at that point, and the difference in levels is a measure of the increase due to the solid volume of the sample. The following typical results for per cent volume of total solids were obtained with various papers: blottings, 16.7 and 34; roofing 53.5; newsprint (with 12.9% ash), 54.5; note paper (with 18.9% ash), 57.7; book paper (with 30% ash), 79.2; "hard" paper (with 3% ash), 85.7; heavily sized drawing paper, 86.7; parchment paper, 90.0; and condenser paper, 94.1. Paul Klemm. Wochbl. Papierfabr. 73, 359-62 (1942).

Digester Linings

Because of the expansion of the mortar after installation of the lining, stresses develop in the shell which attain a maximum, about 1-2 years after a digester has been in operation. The ideal lining is one which is sufficiently elastic to give with the deformation of the shell, and has sufficient elastic reserve to withstand the pressure of the shell during changes in temperature and pressure, so as not to chip or form cracks, thus preventing leakage to the metal. Rayon pulp manufacture (where the cooking is also carried out with the view of recovering alcohol) subjects the digester lining to very heavy stresses. This is due to the high final temperatures of the cook, followed by displacement of the liquor by water.

There should be a minimum of cooling of the digester during this displacement period. This is particularly true of digesters carrying recently installed linings, since the elasticity reserve is not yet sufficiently high. The double brick layer is recommended in the lining. Outside insulation, however, while it contributes to maintaining a high temperature in the lining has a deteriorating effect. The best conditions are not always understood, and good digester lining depends in great measure on experience. V. Terling. Papir-J. (Norway) 30, 113-4 (Sept. 30, 1942) through B.I.P.C. Feb., 1943.

Permeability of Transparent Wrappings

The article discusses laboratory measurements of permeability of transparent wrappings. The average water vapor permeabilities are given for 39 C. in terms of grams per sq. meter per day per mm. For moisture-proof cellulose film, 0.27g; rubber hydrochloride, 1.02; nitrocellulose 4.1; cellulose acetate, 17.4. Figures are also given for seams, joints *et al*, and the overall permeability of a package is thus evaluated. Packages made from heat-sealed films have a shelf life of at least 14 months. Those from glued film have a possible life of 9 months, but waxed glassine has a life of only a month. The following must be taken into account in designing impermeable packages: the minimum area of film should be exposed, creases and sealing areas must be reduced to a minimum, crumpling must be avoided, and adhesives must be selected carefully and applied carefully. C. R. Oswin. J. Soc. Chem. Ind. 62, No. 4, 45-8 (1943).

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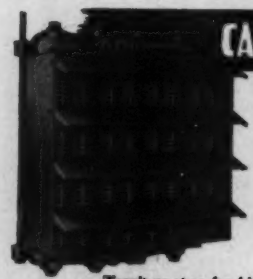

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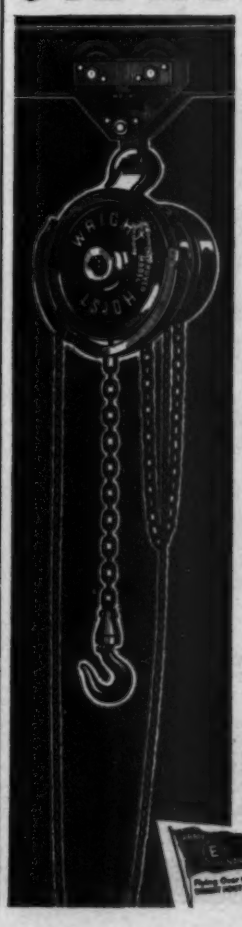

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PAPERMAKING PATENTS

IN THE UNITED STATES — Compiled by James Atkins, Registered Patent Attorney

Inquiries should be addressed to James Atkins, Munsey Building, Washington, D. C.

Pulp Making Process

Patent No. 2,302,270. Max Skolnik, Chicago, Ill. Application April 12, 1938. Serial No. 201,525. 8 Claims. (Cl. 92—13). In the preparation of paper forming stock from straw, the method which comprises submerging the straw in unit containers in a mild alkaline cooking liquor at a temperature below the boiling point and at substantially atmospheric pressure, and controlling the cooking by maintaining the proportions of sodium hydroxide and carbonates within the desired limits in the cooking liquor.

Manufacture of Papermaking Fiber

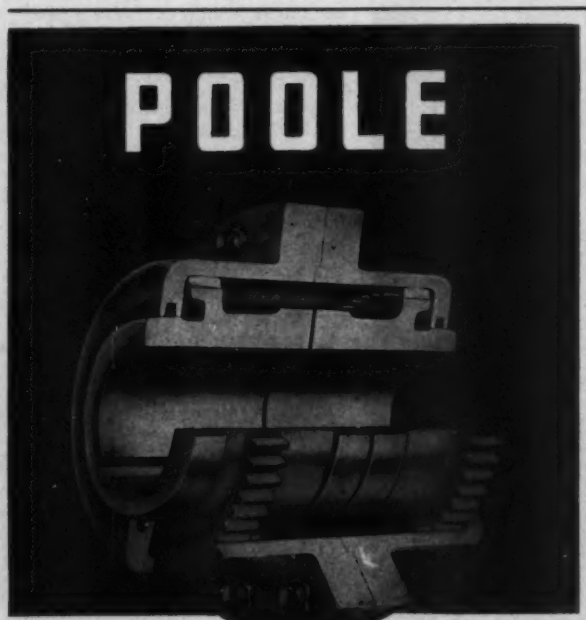
Patent No. 2,298,994. Sidney D. Wells, Combined Locks, Wis., assignor to The Institute of Paper Chemistry, a corporation of Wisconsin. Application June 25, 1941. Serial No. 399,615. 2 Claims. (Cl. 19—5). The method of making an improved papermaking fiber which consists in subjecting dry flax straw to a percussive treatment so as to shatter the woody parts and thereby detach most of the bast fibers from the shive parts, and subsequently subjecting the material to a carding operation so as to separate the bast fiber from the shive parts, and mechanically separating the larger particles of the shive from the smaller particles of the shive, and then repeating the percussive and carding treatments in the case of the larger particles of shive so as to salvage the bast fibers not effectively detached from the shive parts during the first percussive treatment.

Method of and Apparatus for Coating Paper

Patent No. 2,299,026. Carl J. Merrill, Portland, Maine. Application February 23, 1938. Serial No. 191,870. 6 Claims. (Cl. 91—45). Apparatus of the class described for applying coating materials in semi-liquid form to a traveling web, comprising a tank for containing said coating materials, a roll partially immersed in the coating materials in said tank, means to rotate said roll, a second roll mounted out of contact with the coating materials in said tank and fixed at a predetermined distance from said first roll, effective to receive coating material in semi-liquid form of a predetermined thickness from said first roll, means to rotate said second roll, means for moving the web past said rolls and a nozzle extending in proximity to said second roll and directed toward said web at an angle effective when a jet of air is forced through said nozzle, to impinge a jet of air against the surface of said second roll, and deflect coating material therefrom to said traveling web. The method of applying semi-liquid coating materials to a traveling web which comprises the transfer of said materials from a source of supply, a second transfer of said materials to a moving surface whereby they are deposited thereon in a layer of predetermined thickness, the removal of said layer of materials from said moving surface by a jet of air, the atomization of said materials during said removal, and the impingement of said atomized materials on the surface of a traveling web.

Paper Manufacture

Patent No. 2,299,459. Henri G. Chatain, Erie, Pa., assignor to Hammermill Paper Company, Erie, Pa., a corporation of Pennsylvania. Application March 15, 1940. Serial No. 324,021. 14 Claims. (Cl. 34—41). The method of controlling the drying of paper passing through upper and lower sets of dryer rolls in a paper machine, said method comprising preventing substantial escape of air from the zone intermediate said sets of rolls to thereby maintain in contact with the paper between said sets of rolls a substantially isolated mass of humid air to prevent substantial drying of the paper in said zone.



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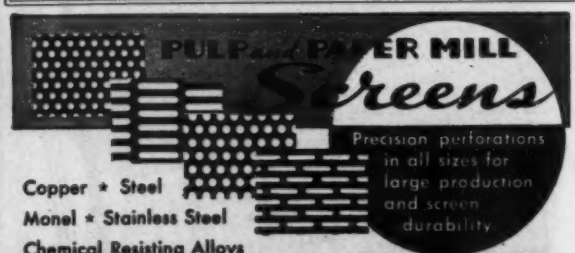

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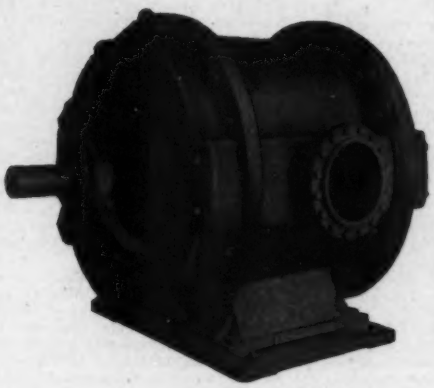

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New Catalogues and Publications

Acme Steel Co., Chicago—Acme Process News No. 13 contains several interesting items on the latest shipping practices; how speedier carton stitching is accomplished, how replacement parts for army vehicles, dehydrated juices, explosives, military supplies, and even candy for soldiers are prepared for a safe journey. Free copies of the informative house organ are available from the company at 2840 Archer Avenue.

Babcock & Wilcox Co., New York City—This company has just published a 40-page booklet on its marine boilers, and has included engineering data of interest to naval architects, chief engineers, marine superintendents, and port engineers. There are sections on the physical properties of fuel oils and specimen analyses of typical coals produced in fields which supply seaboard and lake areas, and authoritative tables on the properties of steam.

W. H. & L. D. Betz, Frankford, Philadelphia—This company is now offering reprints of two articles published in *The Oil and Gas Journal.* The first is "Chemical Treatment of Boiler Water" (Betz Technical Paper No. 84) by John Drew Betz, which appeared in the March 25th issue, and the second is "Chemical Treatment of Cooling Water" (Betz Technical Paper No. 85) by W. A. Tanzola, which appeared in the April 22nd issue.

Cochrane Corp., Philadelphia 32—Reprints of the article "Acid-Regenerated Zeolites" by Frank Kemmer and Joseph Thompson, which appeared in the June, 1943 issue of *Power Plant Engineering* are now available from this company. This organization has also published a new catalogue, No. 4021, on "Cochrane Carbite Softeners." The bulletin describes the many uses and applications of the newly developed carbonaceous zeolite softeners, particularly as pertaining to the treatment of boiler feed water supplies.

Dings Magnetic Separator Co., Milwaukee 7, Wis.—The operation and maintenance of magnetic pulleys has been thoroughly covered in a new 40-page handbook recently released by this company in an effort to help industry secure maximum performance from this type of equipment. The contents feature information on trouble-shooting, trouble prevention, repairs, recommended operating practices, and general maintenance. A discussion of magnetic theory is included as a background for the practical suggestions offered. The publication is liberally illustrated with drawings and diagrams, and includes a number of simple formulae, a pulley selection table, and other data. Copies available from the company.

Fairbanks, Morse & Co., Chicago 5—"Fairbanks-Morse Diesels for Profitable Power" is the title of the new publication of this organization. The booklet includes a brief history of the company's background, together with particulars on design, manufacture, and service facilities applicable to the entire commercial line of marine and stationary Fairbanks-Morse diesels. Included with the bulletin is a loose leaf supplement sheet giving detailed operating cost data for typical Fairbanks-Morse municipal plants. Requests for the booklet should be sent on company letterhead to Fairbanks Morse.

Farrel-Birmingham Co., Inc., Ansonia, Conn.—This company has just issued a new booklet which will be of interest and use to superintendents, maintenance men, roll grinder operators, and others who are responsible for the care and maintenance of rolls and calenders in the paper mill. Entitled "A Practical Guide to Care of Calenders and Calender Rolls," the booklet discusses the common causes of roll trouble and gives many helpful hints on roll maintenance and grinding procedure. Instructions for lubrication of calenders and grinders are also included. Copies are available from the company.

Farval Corp., Cleveland, Ohio—Bulletin No. 15, "The Multival Lubricating System," contains information on providing positive lubrication to a group of bearings from a central distributing block. Like other Farval equipment, this system delivers lubricant to individual bearings under pressure. With multival, however, oil or grease is supplied to the multiple valve blocks by means of a manual or power-operated portable gun. Other Farval manual and power systems are also included in the booklet.

General Electric Co., Schenectady, N. Y.—Three new bulletins have been issued by this company. The first is GET-1173, "Electric Instruments, Principles of Operation," which presents a concise discussion of the characteristics of instruments, what makes them operate, and the individual limitations of the various type. The second, GEA-1437D describes the many types of gear-motors now furnished by General Electric, lists their advantages, and indicates the various locations where their use is most desirable. The third bulletin is entitled "How Electronic Tubes Work" (GEA-4116) and is designed primarily for industrial engineers. Illustrated with 117 sketches and photographs, the book is a primer whose main emphasis is on how the electronic tube operates. Copies of the bulletins are available upon request.

Insulux Products Div., Owens-Illinois Glass Co., Toledo, Ohio—Methods of replacing worn-out windows with Insulux glass block are described in detail in

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Paper and Pulp Section
National Safety Council, Inc.
20 N. Wacker Drive, Chicago 6, Ill.

You will also receive a complimentary copy of our Accident Facts Memo. No. PP-1, "Hand Tool Accidents in the Paper Industry."

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HILLS-McCANNA SAUNDERS PATENT DIAPHRAGM VALVES

DIAPHRAGM AUTOMATICALLY HEADS OFF ALL VALVE TROUBLES

Hills-McCanna Valves offer constant protection against shut-downs, delays and interruptions. Their distinctive diaphragm principle isolates all working parts from the fluid—there can be no scoring, no wear, no corrosion—consequently, no leaking—sticking, clogging or freezing—no contamination of product. The valve operates perfectly from wide open to dead tight and is excellent for throttling service. There is no stem or stuffing box packing, providing low cost service with practically no maintenance.

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PROPORTIONING PUMPS • AIR & WATER VALVES • CHEMICAL VALVES
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Water, Oil or Grease lubricated. These bearings wear longer; reduce power consumption; save vital war metals. Use Ryertex for: Jordans, Beaters, Press and Couch Rolls, Grinders, Calenders, etc.

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a new booklet just released by this company. Photographs of typical installations are included in the booklet, along with specifications, technical data, and typical construction details.

Oster Mfg. Co., Cleveland, Ohio—Four manuals have recently been prepared by this company covering the operation and maintenance of portable and stationary pipe threading machines, as well as spare parts for them. The booklets are No. 300 Series Pipe and Bolt Threading Machines; No. 422 Power Vise Stand, a portable power drive for hand pipe tools; No. 502, "Pipe Master," a complete, portable pipe threading machine; and No. 562, "Tom Thumb," a pipe threading machine.

Photovolt Corp., New York City—A new descriptive folder has just been released by this company on its "Photoelectric Glossmeter." Included in the information contained in it is material dealing with the application of the instrument to paper tests.

Roots-Connersville Blower Corp., Connersville, Ind.—Inert gas generators, built by this company, are discussed in Bulletin No. 100-B14, which has just been issued. This is an 8-page booklet, printed in two colors, and contains much information, including construction and operation, high pressure installation and application. Size, dimension, and weight data on "R-C" inert gas generators is also given. Available upon request.

Books

Seven Booklets on Supervisory Problems—Written by Glenn Gardiner, these comprehensive, yet easy to understand paper-covered manuals individually cover subjects of pertinent interest to industrial foremen. The titles and a brief description of each booklet follow:

Qualities Of A Good Boss—This booklet presents 15 qualities and characteristics of a good boss. It also includes a series of questions which make it possible for a foreman to rate himself on each of the fifteen attributes. (Single copy 30 cents.)

How To Train Workers Quickly—Divided into three sections, this booklet supplies information on how to instruct, and on the training of women; and presents a series of practical self-test questions by which a foreman can check his knowledge of job instruction. (Single copy 45 cents.)

How To Handle Grievances—This booklet lists 32 possible causes of employee grievances and then proceeds to reveal how to handle them. (Single copies 45 cents.)

How To Create Job Satisfaction—Giving New Employees A Good Start, and Making Jobs Desirable are the two main themes of this booklet. (Single copy 45 cents.)

How To Correct Workers—This Manual outlines 14 errors, habits, and attitudes of workers which most often need correction. Five of the subjects are: When Men Don't Follow Instructions, If Men Abuse Tools and Equipment, If Men Are Indifferent About Safety, Men With Disorderly Work Habits, and Men Who Stir Up Trouble. (Single copy 30 cents.)

How To Cut Waste—This booklet is divided into two parts. The first part discusses various subjects relating to spotting the causes of waste and on how to attack waste. (Single copy 35 cents.)

How To Get Out More Work—Man-power, plan-power, and machine-power, are discussed briefly in this manual as the three basic power factors involved in getting out more work. Specific methods and concrete suggestions for utilizing machines, manpower and materials at hand also are included in the booklet. (Single copies 35 cents.)

Elliott Service Company, 219 East 44th St., New York 17, N. Y., is publisher of the manuals.

The Composition of Paper and Paperboards Manufactured in 1939—Designated as Circular No. 668, this publication is the work of R. V. Reynolds, forest economist, and Albert H. Pierson, assistant forester, Division of Forest Economics, Forest Service, United States Department of Agriculture. It is a 24-page pamphlet which discusses the use of fibers in paper, the composition of paper and paperboards in 1939, how fiber requirements have been met at home, dependence upon foreign fiber, and outlook for the future. Obtainable from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., the price of the circular is 10 cents a copy.

The Industrial Cafeteria and Restaurant Worker's Manual—Written by Milton A. Rosenfeld, Restaurant Management Consultant, this manual provides fundamental information on proper serving of meals to keep production workers healthy and strong. The work is non-technical in character. It touches upon the importance of work in the plant cafeteria, the need for considerate service, the reason for planning, the essentiality of personal cleanliness, the responsibility of cleanliness of physical equipment, the avoidance of accidents, the dangers in handling food, and the storage of food and supplies. It also touches upon rolling restaurants, the steam table equipment of the cafeteria, as well as the preparation of a simple recipe, cookery, and other related subjects. Totaling a little over 100 pages, the book, attractively bound, is priced at $1.25 a copy by National Foreman's Institute, Inc., Deep River, Conn., the publisher.

CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS — *per cwt.*

OPA ceiling prices in sales to consuming mills delivered buyer's usual receiving point, with brokers' allowance not in excess of 5 per cent.

Blue Overalls	-5.50
Corduroy, Men's	-3.50
Corduroy, Ladies'	-3.00
Washables, No. 1	-3.00
Percales	-4.75
New Soft Blacks	-3.75
Light Prints, No. 1	-4.50
Khaki Cuttings—	
Bleachable	-4.25
Unbleachable	-3.50
New White Canvas	-6.50
New Mixed Blacks	-3.25
Canton Flannels, Bleached	-7.00
Shirt Cuttings—	
New White No. 1	-7.25
No. 1 White Headings	-7.25
White Shrunk	-5.00
Sliesias No. 1	-5.75
New Unbleached	-7.50
Fancy	-3.50
Linen Cuttings—	
American	-3.00
White	-14.00
Grey	-14.00

RAGS (Domestic)

f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowances of $1 to $2 a ton depending on the value of the grade involved.

	per ton
Roofing—	
No. 1	31.00
No. 2	30.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	78.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)

ex dock New York City

NEW RAGS — *per cwt.*

New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Sliesias	
Light Flannelette	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS — *per cwt.*

No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	3.75 to 4.00
Wool Tares—	
Light	3.75 to 4.00
Heavy	4.00 to 4.25
No. 1 Scrap Bagging	3.50 to 3.75
Manila Rope—	
No. 1 large	-*115.00
No. 1 small	-*105.00
Sisal Rope—	
No. 1 large	-*95.00
No. 1 small	-*85.00
New Burlap Cuttings	5.75 to 6.25
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
No. 1 sisal	-*80.00
No. 2 sisal	-*60.00
Soft Jute	5.00 to 5.25
Mixed	1.50 to 1.75

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER

OPA ceiling prices f. o. b. points of shipment, with brokers' allowance of 4 to 9 per cent.

	per ton
Shavings—	
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, Unruled	57.50-
Soft White, One-Cut	57.50-
Soft White, Mix.	43.00-
Fly Leaf, No. 1	33.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Flat Stock—	
No. 1 Heavy Magazines	33.50-
Mixed Books	17.00-
Ledger Stock—	
No. 1 White	43.50-
No. 1 Mixed (Colored)	37.50-
Manilas—	
New Env. Cuttings	53.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	37.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	65.00-
Mixed Env. or Bag Cuts	55.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	35.00-
News—	
White Blank	33.00-
Overissues	17.00-
No. 1 Baled	15.00-
Old 100% Kraft Corrugated Containers	35.00
Old Corrugated Containers	23.00
New Corrugated Cuts	18.00-
Mill Wrappers	17.00-
Box Board Chips	14.50-
No. 1 Mixed Paper	14.00-

CHEMICALS

f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to -
Bleaching Powder—	
Drums, cwt.	2.25 to 2.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	24.00 to 24.75
80-100 mesh (bags), lb.	—
Argentine, lb.	—
China Clay—	
Domestic Filler Bulk (mine) ton	7.50 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	15.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.50
Litharge, powd., bbl., lb.	.09 to -
Rosin (Gum)—	
New York, per 100 lbs.	
E	4.44-
F	4.45-
G	4.55-
WW	5.36-
Rosin (Wood), carlots	3.25-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	30.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30 -
Ground and flake, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.10-
Pearl, barrels, cwt.	3.20-
Paper (Sp.) bags, cwt.	3.20-
barrels, cwt.	3.30-
Sulphur (crude)—	
(mine) bulk, long ton	16.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide, bbls., lb.	5.00 to 5.85

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo.:

Bleached softwood sulphite	76.00
Unbleached softwood sulphite	66.00
Bleached hardwood sulphite	73.50
Unbleached hardwood sulphite	63.50
Bleached Mitscherlich sulphite	81.00
Unbleached Mitscherlich sulphite	72.00
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Standard news print siderums	66.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	63.50
Bleached soda pulp	66.00
Unbleached soda pulp	62.00
Ground wood pulp	46.00
Sulphite screenings	38.50
Sulphate screenings	38.00
Ground wood screenings	30.00
Northern unbleached sulphate siderums	73.00
Southern unbleached sulphate siderums	63.50

PAPER

f. o. b. New York City

	per ton
Boards—	
Binders	84.00-
Chip	45.00-
Chip, sgl. mla. lined	60.00-
Coated, white patent .016	80.00-
.020 and heavier	75.00-
Kraft liner	63.00-
News	48.00-

Book Papers—OPA base maximum prices per cwt. 4 cases or equivalent, f. o. b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	8.25
B Grade E. F.	7.80
C Grade E. F.	7.55
D Grade E. F.	7.30
E Grade E. F.	7.05
No. 2 Uncoated Offset 4 sides. White	8.45

Coated White (Trimmed 4 sides)

No. 1 Glossy	11.90
No. 2 Glossy	10.85
No. 3 Glossy	10.15
No. 4 Glossy	9.80
No. 5 Glossy	9.30
C2S Offset	10.40
C1S Litho (Varnish)	10.05
C1S Litho (Non-Varnish)	9.80

Writing Papers—OPA base maximum prices per cwt. on writing papers, f. o. b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—	*per cwt.* 20 lb.	16 lb.
Extra 100% Rag	34.00	34.00
100% Rag	33.00	28.00
75% Rag	20.00	20.00
50% Rag	16.00	17.2.
25% Rag	14.00	15.00

Rag Content Ledger—	*per cwt.* Zone 1
Extra 100% Rag	35.00
100% Rag	29.00
85% Rag	26.00
75% Rag	21.00
50% Rag	17.00
25% Rag	15.00

Sulphite Bond—	*per cwt.* 20 lb.	16 lb.
Air dry, watermarked	12.75	13.70
No. 1 (M. F.) watermarked	9.00	9.70
No. 2 (M. F.) watermarked	8.25	8.85
Plain (M. F.) unwatermarked	7.60	8.20

Sulphite Ledger—	*per cwt.* Zone 1
No. 1 (M. F.) watermarked	10.00
No. 2 (M. F.) watermarked	9.25
Plain (M. F.) unwatermarked	8.60

Glassine (f. o. b. mill)—	*per cwt.*
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50

News—	*per ton*
Rolls (Contract)	*58.00
Rolls (Spot)	(nominal)
Sheets	*66.00

*OPA ceilings, effective September 1.

Tissues (Carlots)—	*per ream*
White, No. 1	1.12½ to 1.20
White, No. 2	1.00-
Bleached Anti-Tarnish	1.15-
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12½ lb. to M shts.) per ca.	.80-
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per ca.	.60-
Toilet, Bleached (M shts.) per ca.	5.65-
Toilet, Unbleached (M shts.) per ca.	4.25-

Towels—	*per case*
Bleached	3.20 to 3.75
Unbleached	2.80 to 3.05

Wrappings (Kraft)—	*per cwt.*
Extra Quality	6.00-
Super-Standard	5.25-
No. 1 Wrapping	5.00-
Standard Wrapping	4.75-
Standard Bag	4.37½-

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f. o. b. mill)	*per cwt.*
Bleached papers—	
M.F. & M.G. Waxing, 20 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.25
Envp. Mla., Sub. 16-32 (No. 2)	5.75 to 6.00
Envp. Mla. (Prices based on large sheets untrim'd remarked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-22 lb.	7.20 to 7.40
Grade B-20 lb.	6.75 to 7.00

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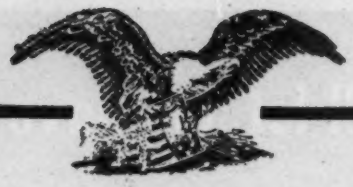

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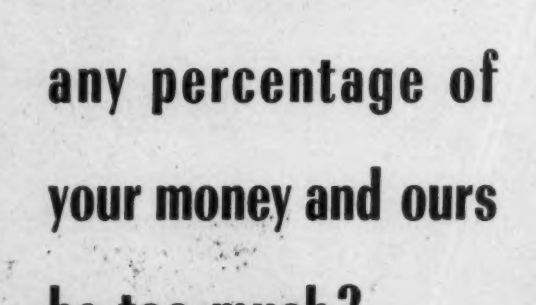

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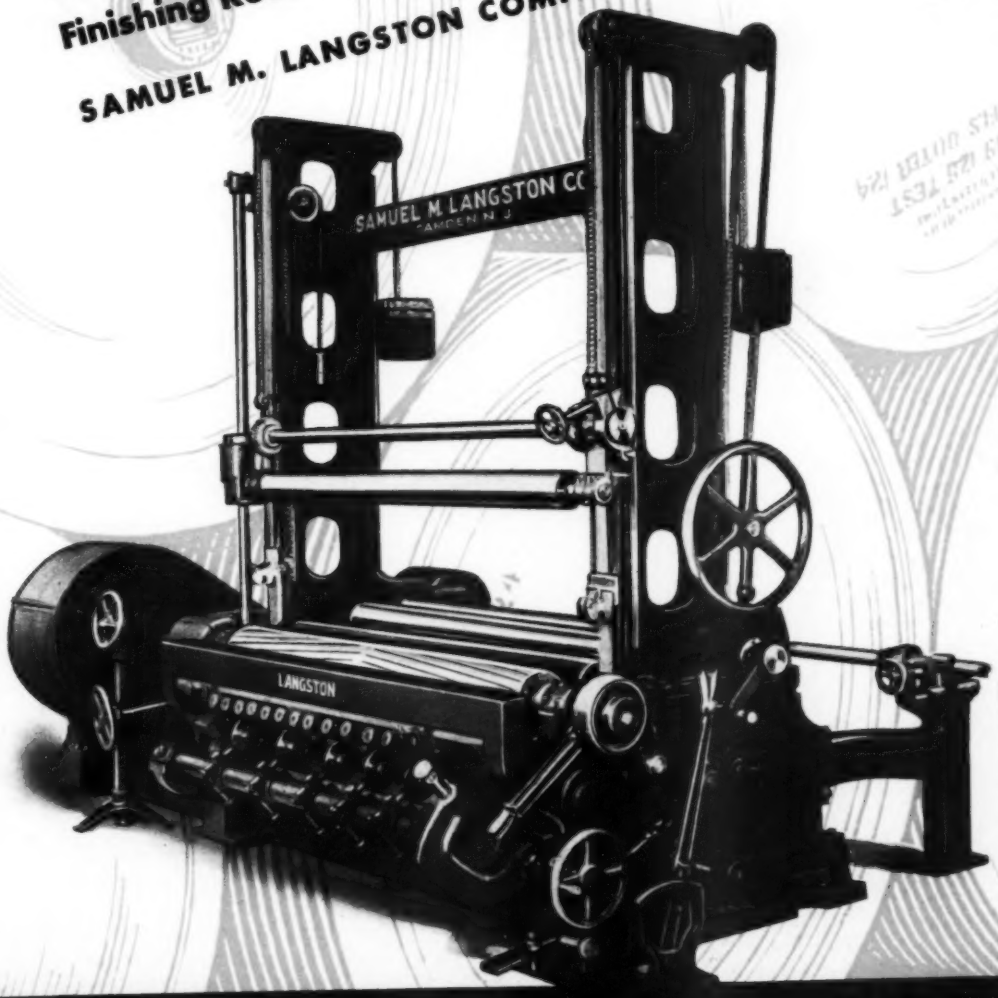

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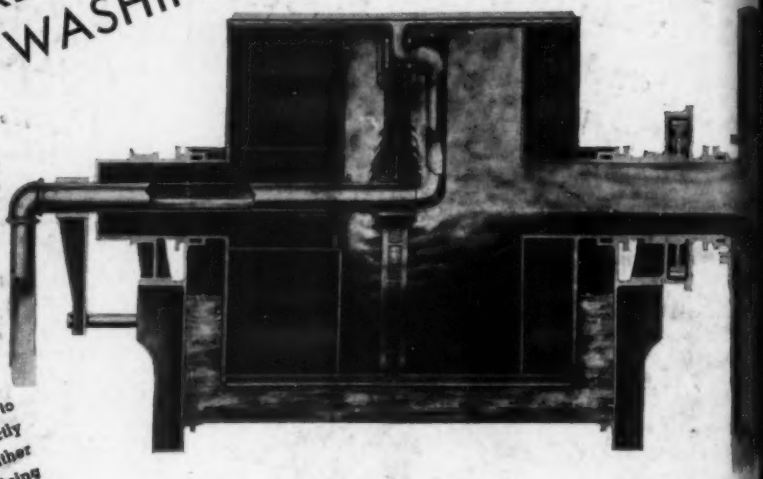

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